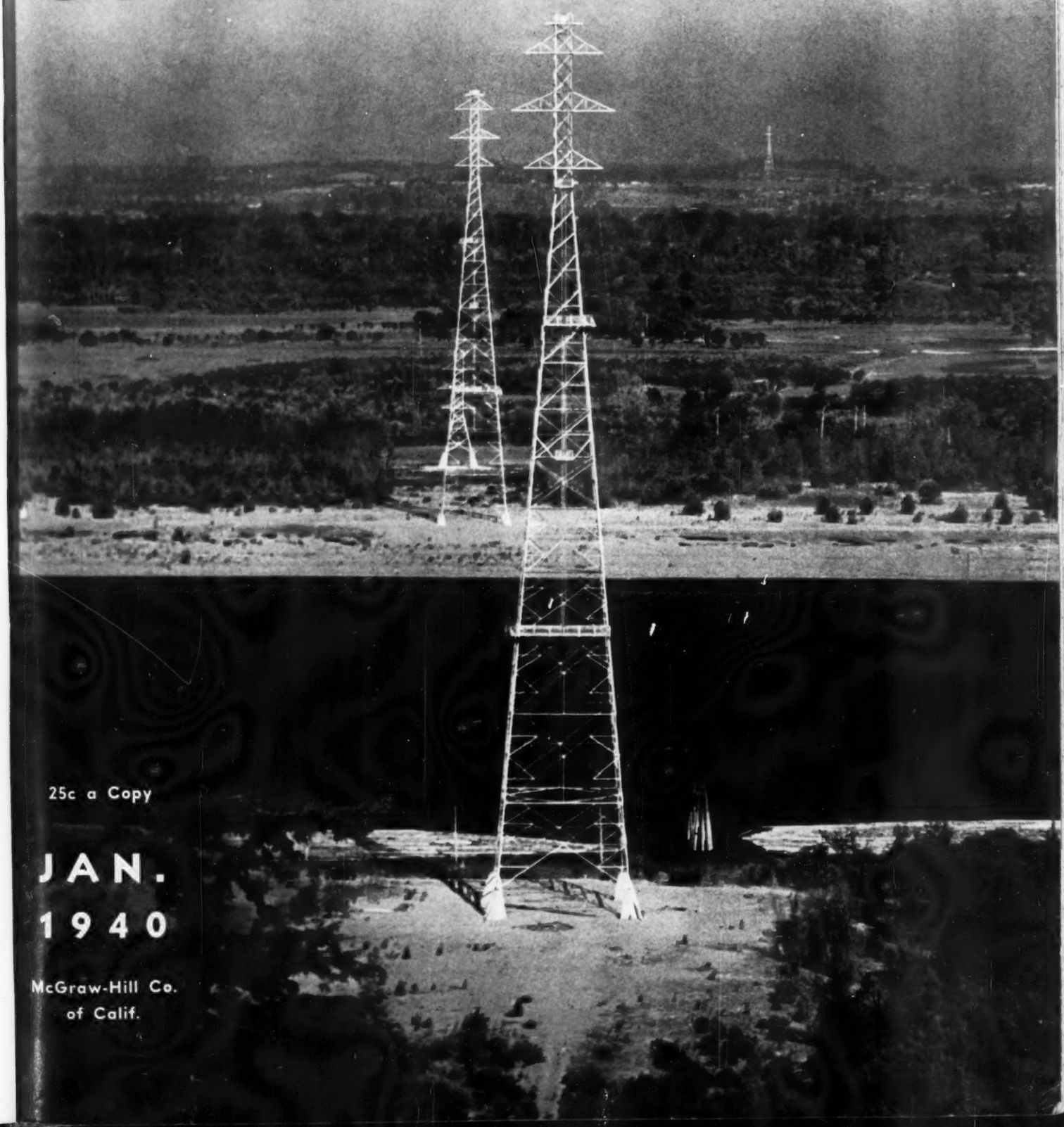
ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS



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1940

McGraw-Hill Co.
of Calif.

Don't forget... when it comes to automatic cooking . . . an electric range is so automatic there's practically nothing to forget. It does all the remembering for you. And results are always good with dependable electric heat. For a trunkful of thrilling cooking satisfaction . . . go electric now.
SWITCH TO Automatic ELECTRIC COOKING
SALES due to Better Lighting
Light Up . . . light is so
ELECTRIC COOKING COSTS NO MORE
Switch To Modern Electric Cooking Now
See the new electric ranges at your dealer's store or edison office
Now is every electric range owner to get the facts about . . .
ELECTRIC HOT WATER
WHAT A RELIEF TO HAVE ALL THE HOT WATER I WANT, AUTOMATICALLY WITHOUT A THOUGHT OR WORRY...
Thrifty
ELECTRIC RANGE VERY ECONOMICAL
Electrical Times
YES MAM!
ELECTRIC ROASTER Sale
$3
LOW PRICES AND EASY TERMS ON ALL MAKES

IN 1940, *Edison Advertising* WILL AGAIN COVER THE APPLIANCE FIELD

Year after year Edison advertising has covered the electrical appliance field, promoting the modern electrical way of living, building business for the entire electrical industry. In 1940, consistent advertising—newspapers, magazines, direct mail, outdoor, etc.—will again cover the appliance field from ranges to toasters, from adequate wiring to modern lighting, from factories to homes, from cities to farms. More electrical appliances will be purchased in 1940 than ever before . . . and Edison advertising will furnish strong support for your merchandising and selling activities.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

MAR 7 1940 Publisher's binding

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Investment of $1,440 Yields $2,266 Annually

THE PROFITABLE EXPERIENCE OF A SOUTHWESTERN UTILITY WITH DISTRIBUTION CAPACITORS

AN annual return of 50 per cent *more* than the cost of installation—that was the result of the Albuquerque Gas & Electric Company's decision to solve a problem in undervoltage by the application of distribution capacitors.

WHY CAPACITORS WERE SELECTED

Voltage conditions, recorded on a 2400-volt feeder about 1½ miles from the substation, showed a drop of 7.6 per cent below normal. Since the line power-factor was only 89 per cent, it was obvious that a large percentage of this voltage drop could be attributed to the reactive amperes causing the low power-factor. So it was decided that the installation of capacitors to improve the power-factor was the logical way to solve the voltage problem.

WHAT THE CAPACITORS DID

After the installation of a pole-type Pyranol capacitor equipment, the peak-load power-factor was raised from 89 to 96 per cent. As a result of the power-factor increase, the voltage drop on the feeder was reduced to 3.4 per cent—an improvement of *more than 50 per cent.*

HOW THE CAPACITORS SAVED

Direct Savings

In revenue	$1,740	annually
In copper losses	526	"
Total	$2,266	

Other Savings

Increased feeder capacity (210 kva @ $25)	$ 657*	annually
Increased substation capacity (78.4 kva @ $15)	147*	"
Increased generator capacity (68 kva @ $120)	1,020*	"
Total	$1,824	

*Amount represents carrying charges at 12½ per cent of investment required to install this additional capacity.

CAN YOU SAVE?

On most systems today there are opportunities for applying Pyranol capacitors to release capacity on overloaded feeders or substations. The installation of capacitors usually means, too, an improvement in voltage conditions and a reduction in line losses. Consult your G-E representative about the application of Pyranol capacitors to your lines. And ask him for a copy of Bulletin GEA-2746, "Pyranol Capacitors for Central Station Application"; or write General Electric Company, Schenectady, New York.

HOW RELIABILITY IS BUILT INTO PYRANOL CAPACITORS

In order to obtain the strongest and tightest joint possible, the two halves of the capacitor case are joined with a single continuous weld. Automatic Thyratron control of this process assures uniformly good welds. This helps to seal the case effectively against the admission of air or moisture which would cause deterioration. Such care in manufacture has contributed much to the operating record of Pyranol capacitors—which is more than 99.8 per cent.

The G-E ten-million-volt lightning demonstration at the New York World's Fair uses 102 Pyranol capacitors, each rated 100,000 volts

GENERAL ELECTRIC

360-144

BETWEEN THIS MONTH'S COVERS

Meet Mr. Bonneville

WHAT THE ADMINISTRATOR SAYS ABOUT BONNEVILLE (p. 27): George C. Tenney, editor of ELECTRICAL WEST, had a real talk recently with the one who dictates the policies of the Bonneville Power Administration, Dr. Paul J. Raver. And the outcome is an interview which discloses a lot of Bonneville's facts, heretofore hidden, or at least not publicized. What will be Congress's reaction to Bonneville this year? And will there be a repetition of TVA along the Columbia River? These are only a few of the questions that you may be able to decide for yourself from the facts as they are now presented by the Bonneville administration and George Tenney.

Dishpan Blues

ONE DISH IN A WASHER IS WORTH TWO IN A SINK (p. 32): A Berkeley, Calif., housewife, Mrs. Irene S. Gray, rises to defend the electric dishwasher, claiming that manufacturers are missing the boat on this labor-saving device. Mrs. Gray hits the nail right on the head many times, and gives the old dishpan a sound thumping. The number of electrical appliances in her home will be a joy to electrical appliance salesmen.

Federal Hydro

SEMINOE'S CONTROL TYPICAL OF NEWER USBR PLANTS (p. 40): As far as the U. S. Bureau of Reclamation is concerned, the electrical installation at Boulder Dam represents the maximum, perhaps even a shade too much, in the way of automatic control. Of course, a plant the size of Boulder introduces special problems, but since then the Bureau has been engaged in building and designing several smaller hydro plants. Typical of these is the Seminoe plant, on the North Platte River in Wyoming. It is an example of the type of engineering the Bureau is carrying on and exemplifies the simplicity and economy it is striving for. Its salient points are described by E. C. Schurch, engineer in the control section of the Bureau's mechanical and electrical engineering division at Denver.

Utilities on the Air

PEPCO'S RADIOS (p. 46): Utilities are finding they can improve their service by availing themselves of the opportunity to operate radio systems between fixed points and moving patrol cars. Portland General Electric Co. is operating a system which benefits service to 100,000 customers throughout 2,500 sq.mi. So far, only one mobile transmitter is in service, but others are contemplated. The system is described by W. A. Leidigh, Jr., who is in Pepco's operating department.

Kit Bag

A SELLING TOOL IN THE NEW PCEB KIT (p. 48: Walter C. Heston, industrial engineer for the Pacific Coast Electrical Bureau, has designed a demonstration kit that's worthy of plenty of note. It's a real improvement over several other kits that have been introduced. With this instrument, Heston would like someone to go after the tremendous and potential market offered by commercial wiring modernization. He uses an auto-transformer, which boosts the voltage to normal lamp rating. Once people see the wasted energy because of low voltage from inadequate wiring, Heston claims that they'll do something about it.

Variety

PUTTERERS' SHOP (p. 50): The Morrison Electric Co. in Portland are caterers to people who like to fix things. Whether things ever get fixed or not is another story, but manager Ray Parrott sends these trouble-shooters home with the right equipment at least. His shop is a modern museum of parts, fixtures and odds and ends. Display plays a great part in closing the sale of many items. Neatly arranged, the stock is before the eyes of customers, and this means there's always something that catches the eye, something extra to make sure that door will stay shut, or the lamp lighted.

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Cover: Bonneville transmission system 300-ft. towers on the Vancouver-Portland line crossing the Willamette River

Define Floods

MOUNT THE PUMPS (p. 52): Eugene Bressels, southern California pumping engineer, watched too many sudden floods sweep away pumps located in dry stream beds, or a deluge from spring rains ruin costly motors, so he set out to do something about it. The result is that this particular equipment is now mounted at least 10 ft. above the actual river bed. Bressels has even designed installations so that pumps may be operated in time of flood.

Anti-Trust

INDICTMENT (p. 56): Electrical contractors in the San Francisco Bay region are the first victims of the anti-trust investigations of Thurman Arnold, assistant attorney general of the U. S. Two associations, two locals of the electrical workers union, and 36 individuals, were named by the Federal grand jury in San Francisco. Dates for trial were to be set Jan. 3, and the case undoubtedly will bring out real controversies, and test many aspects of federal jurisdiction.

While It's News

NEWS OF THE INDUSTRY (p. 60): PUD Commissioners sweep Washington elections . . . Washington Water Power partially abandons rural expansion program . . . U. S. Government carries Hetch Hetchy suit to Supreme Court . . . Rate reductions are declared by Portland General Electric . . . Aluminum Company of America plans for new Northwest plant which will use 32,500 kw. of Bonneville energy . . . Provo, Utah, to buy local distribution system of Utah Power & Light . . . PG and E declines to apply for major license from Federal Power Commission for its Melones project in California . . . Olds named FPC chairman, succeeding Clyde Seavey of California . . . Washington PUD development threatened by suit . . . Southern California Edison to become large-scale radio operator . . . Tacoma City Light fund sought by Washington Public Utilities Commission . . . Schaaf appointed new chief counsel for Puget Sound Power & Light condemnation suits.

A Frank Statement

About Kelvinator's Radically New 1940 Program That Makes Possible Sensationally Low Prices . . . And Greater Profits for Dealers

BY FRANK R. PIERCE, General Sales Manager
Kelvinator Division, Nash-Kelvinator Corporation

I KNOW you will be surprised when you see the prices printed on these pages.

A few days from now they will be published across the country. But before that happens, I want to explain them to all retailers of mechanical refrigerators—because there is not one of you who won't be affected, no matter where you may be located.

Those who built our industry—the dealers—have been waiting for several years for some manufacturer to have the courage to give them a program which meets today's conditions in the refrigeration business.

In a word: Kelvinator's prices and products for 1940 are part of a single broad-gauge program . . . representing radical changes in fundamental policy . . . one that is sound as a dollar from start to finish . . . a program that has these objectives:

1 To protect and stabilize the profits of Kelvinator dealers.

2 To meet the competitive price situation in the electric refrigeration business today.

3 To step up to the replacement business by providing specific products with margins adequate for the dealer to sell this business at a profit.

4 To limit the number of dealers in each community so that sufficient volume is possible, at recommended prices, for dealers to make a profit.

5 To reduce the dealers' investment by reducing the number of models.

In a nutshell, we expect this program to result in increased volume and profits for our dealers and ourselves.

This program is—very candidly—one of the most far-reaching plans ever adopted in an industry. But before I go any farther, I want to make one thing clear. Not only has it been accomplished without a penny's reduction in dealers' retail profits—but without a single compromise in the quality of our product. As a matter of fact, dealers' profits are higher; and the products the best we've ever built.

I think that every dealer who has ever wished for lower prices is entitled to know how Kelvinator was able to put this program into effect:

Briefly, here's what we have done:

1 We've concentrated 96% of our production on the big 6 cubic-foot size models, and larger, that people really need. That lets us lower the price some.

2 In anticipation of greatly increased sales, we've *doubled* our production schedules and passed the manufacturing savings on.

3 We've cut our cost of selling—so we can lower our price still further.

In addition, we have cut our own manufacturing profit per unit in anticipation of greater sales.

And . . . to further simplify dealers' price problems . . . in all states east of the Rockies, we are paying the freight, on carload shipments to destination, and also absorbing the L.C.L. delivery cost from zone or distributor warehouses in excess of 50 cents CWT. This is to permit advertising nationally of suggested retail prices for delivery in the consumers' kitchens.

Now please take a look at the pictures and specifications of the Kelvinators we're selling at these prices.

LOOK AT THE SIZE
LOOK AT THE NAME
LOOK AT THE PRICE
BIG 6¼ CUBIC FOOT Large "Family-Size"
NEW 1940 KELVINATOR from the oldest maker of electric refrigerators
$119.95* Delivered in the Kitchen with 5 Year Protection Plan
KELVINATOR SS-6. Compare with $150 refrigerators. 6¼ cu. ft. Bright Permalux exterior. Porcelain-on-steel interior. Stainless-steel, high-speed Freezer with white Permalux-finished door. 2 extra-fast Freezing Shelves, 9 lbs.—84 ice cubes. Kelvin Cold Control. Tempered glass, Cold Storage Tray under freezer. Interior Light. Powered by famous cost-cutting Polarsphere sealed unit. Kelvinator's price only $119.95*

THE BEST KELVINATORS EVER BUILT NO PRIOR-YEAR MODELS

You will note first of all that price reductions apply to the whole Kelvinator line . . . from the base-price model right up to the de luxe models. Reductions range from $30 to $60, as compared with last year's prices.

Next thing is: every Kelvinator here is a new *1940* product. There isn't an obsolete last-year model in the line.

Our idea of meeting low-price competition is *not* giving our dealers a year-old model, with probably shorter discounts. Instead, we're starting our dealers with a clean, *new* stock.

And these Kelvinators are remarkable in another respect. You've heard of "bargain" refrigerators before. This isn't it. You've probably had to contend with stripped-down, second-line products. You won't find them here.

Let me repeat: *these are the finest Kelvinators we know how to build—1940 models every one.* Starting with the fine, big, six-cubic-foot models, and working right on up through the big de luxe jobs, they surpass any Kelvinators ever built before.

I can't stress this too strongly.

Take our Model SS-6 for 1940, selling at $119.95.* If you'll examine it carefully, point for point, I know you'll agree you've never seen a current model made by a nationally-known manufacturer within thirty or forty dollars of its price!

Try to match its specifications and you'll see what I mean. Every Kelvinator is powered by the big Polarsphere sealed unit. We don't use a cheaper, weaker unit in our low-priced models. I think you know about the reliability of this unit. Of *all* the 1939 Polarspheres in use all over the world less than ½% have been replaced for mechanical reasons. I believe that's an industry record.

Other basic features are of the same high quality. Cabinet is welded-steel and finished in Permalux outside . . . all Porcelain-on-steel lining within. Insulation is the best.

Yes—it's a big, solid, fine-looking refrigerator. And any dealer will say—it has the features that *sell.*

But it's only the beginning of Kelvinator's great 1940 line. Every model in the line has "step-ups" in features that make "selling up" natural, logical and easy.

EVERY FEATURE OTHERS OFFER PLUS OUR OWN EXCLUSIVES

And when you handle that beautiful de luxe job . . . Model HD-6 . . . for only $209.95*—you have a refrigerator nobody's competing with.

With the new "Moist-Master" humidity system and all those other features you can see on the next page—it's the last word in fine refrigeration.

I want you to check this when you look at the pictures. And note that the price is what you used to sell "standard" models for.

Just count them. Five big "sixes". Prices from $119.95* to $209.95.* Compact three and four-footers, too (but it's just as easy, now, to sell a "6") and 3 eight-cubic-foot models.

Can you imagine what Kelvinator dealers will do with products and prices like these?

I'll tell you. They'll stop worrying about competition in any shape or form. They'll sell Kelvinators at a profit and lots of 'em. I don't believe they'll find it necessary to cut their prices to meet competition.

TWO VAST MARKETS ARE NOW WIDE OPEN TO KELVINATOR DEALERS

But . . . far beyond "meeting competition" . . . Kelvinator dealers will also cut straight into two vastly broadened markets.

One is the replacement market. You know scores of families right in your own neighborhood who are still getting along on worn-out, noisy, wasteful or undersized mechanical refrigerators.

As a matter of fact, there are at least *four million* families like that in the country.

When you go into that market with the 1940 Kelvinators especially designed and priced for that market . . . when you show them the bigger, finer, refrigerator with every modern convenience . . . when you prove it costs many dollars a year less to run—*that replacement business is yours.* And you can afford to trade at a profit because the prices and margins are there to help you trade.

And then there's that vast low-income market adequately provided for with models selling this year from $30 to $60 less than similar models in 1939. Only this year they are better looking and have more salable features.

You'll be able to sell a Kelvinator—a big, genuine 6¼-cubic-foot model . . . with Kelvinator quality through and through . . . for little more than the price of a good icebox. Further, for those who want additional equipment, convenience and de luxe features, Kelvinator has four more "Sixes" at prices that will fit their pocketbooks.

HEAVY ADVERTISING CAMPAIGN

I think you'll agree . . . this is a great product story. Actually, it is one that others have wanted to offer for years. And now Kelvinator does it.

But we're not just letting our 1940 product "sell itself". We're going to spread the news big—and spread it *now.*

In a few days, newspaper ads in large, dominating space will carry Kelvinator's story to local markets clear across the country.

Close on their heels, full-page color ads will break in national magazines.

You'll see "Look at the Size" . . . "Look at the Name" . . . "Look at the Price"—*everywhere.*

POWERFUL PROMOTION BACKING

I'll venture to say that our coming Spring Showing Activity will bring you the greatest rush of business you've had in years.

We'll be backing you with a great new Direct Selling Program and complete sales training helps from the Kelvinator National Salesmen's Institute.

Kelvinator's own finance company . . . ReDisCo . . . has even worked out a brand new "5-Sixes Plan" to make it easier for you to buy—so you can start selling quicker.

Frankly, I think this is the most far-reaching program any manufacturer will offer this year. It's not only a matter of products, prices, margins, prepaid freight, new advertising, and new sales methods. In fact, it's a *whole new way of doing business and making money.*

HOW TO GET FULL FACTS

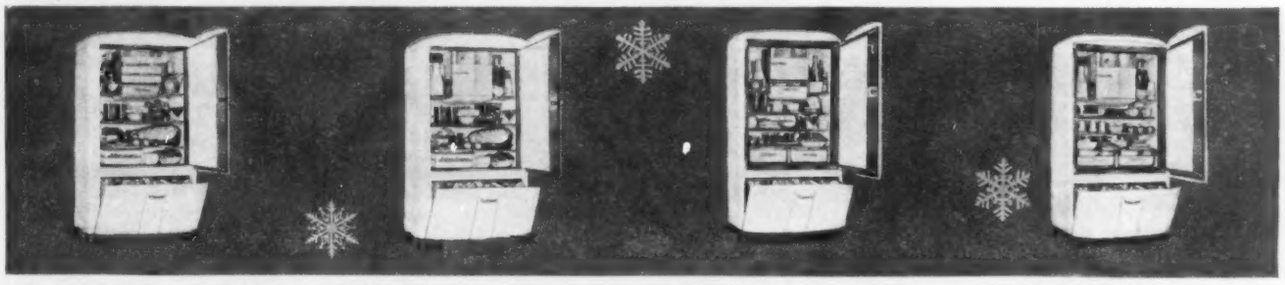
If you are not a Kelvinator dealer, the only way to realize what this revolutionary program means is to get in touch with us through your nearest distributor or factory branch.

Or, if you like, communicate with me direct.

Frank D. Pierce

General Sales Manager
KELVINATOR DIVISION
Nash-Kelvinator Corp., Detroit, Mich.

**Prices suggested are for delivery in the Kitchen with 5 Year Protection Plan. State and local taxes are extra. Prices are slightly higher west of the Rockies.*

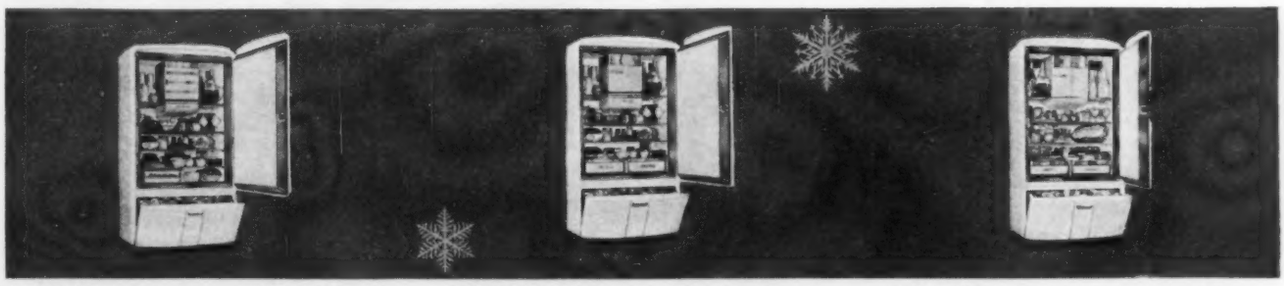


KELVINATOR S-6. Compare with $180 refrigerators. 6¼ cu. ft. completely equipped model. Gleaming Permalux exterior with Porcelain-on-steel interior. Sliding glass covered Vegetable Crisper. Deep, sliding, moonstone glass Cold Storage Tray under Freezer. Vegetable Bin. Removable half-shelf next to crisper. Stainless-steel freezer with door, 2 extra-fast Freezing Shelves, 8 lbs.—64 ice cubes, new type Ice Trays, Kelvin Cold Control. Powered by Polarsphere sealed unit. Interior Light. Kelvinator's price only **$139.95***

KELVINATOR HS-6. Compare with $230 refrigerators. A new 6 cu. ft. Kelvinator with the "Moist-Master" System that maintains higher humidities, decreasing the loss of moisture from foods. Permalux exterior and Porcelain-on-steel interior. Meat Compartment built in the freezer unit behind freezer door. Sliding, glass covered Vegetable Crisper. Vegetable Bin. 2 extra-fast Freezing Shelves, 8 lbs.—64 ice cubes, new type Ice Trays. New, flat, disc-type Kelvin Cold Control. Powered by Polarsphere sealed unit. Interior Light. Kelvinator's price only **$169.95***

KELVINATOR R-6. Compare with $210 refrigerators. 6.5 cu. ft. Twin Sliding Crispers with glass tops. Sliding, Porcelain Cold Chest. Vegetable Bin. Sliding adjustable Shelves. Twin dome Lights. Stainless-steel Freezer with door, 2 extra-fast Freezing Shelves, 8 lbs.—72 ice cubes, built-in Tray Lifter and built-in Speedy-Cube Release. Double-size Ice Tray for frozen desserts. Kelvin Cold Control with automatic return from defrosting. Powered by Polarsphere sealed unit. Kelvinator's price only **$179.95***

KELVINATOR HD-6. Compare with any refrigerators from $230 to $300. A new, 6.1 cu. ft. de luxe Kelvinator with "Moist-Master" System. Twin Sliding Crispers with glass tops. Vegetable Bin. Meat Compartment built in the freezer unit behind freezer door, 2 extra-fast Freezing Shelves, 8 lbs.—72 ice cubes with built-in Ice Tray Lifter and Speedy-Cube Release. New, flat, disc-type Kelvin Cold Control. Twin Dome Lights. Polarsphere sealed unit. Permalux exterior. Porcelain-on-steel interior. Kelvinator's price only . . **$209.95***



KELVINATOR S-8. Compare with $220 refrigerators. A big 8.2 cu. ft. refrigerator with 16.3 square feet shelf space. Has Stainless-steel freezer with white Permalux-finished door. New type ice trays freeze 12 lbs.—96 cubes. Sliding glass covered Crisper, Glass Cold Storage Tray, Vegetable Bin, Automatic Interior Light. Beautiful Permalux exterior, stainless Porcelain-on-steel interior. Powered by Polarsphere sealed unit. Kelvinator's price only . . **$189.95***

KELVINATOR R-8. Compare with $250 refrigerators. 8.2 cu. ft., 16.3 square feet shelf space. Built-in Tray Release and Speedy-Cube release, 12 lbs.—108 ice cubes. Stainless-steel Freezer with new full height door. Twin glass covered Crispers, Twin dome Lights. Sliding porcelain Cold Chest, Vegetable Bin. Kelvin Control with Automatic return from defrosting. Sliding Adjustable Shelves. Powered by Polarsphere sealed unit. Kelvinator's price only **$209.95***

KELVINATOR HD-8. Compare with the finest refrigerators at any price. A new de luxe 8 cu. ft. model completely equipped including "Moist-Master" System. 15.9 square feet shelf area. Twin Sliding Crispers with glass tops, Twin Dome Lights. Meat Compartment built in freezer unit behind door, built-in Ice Tray Lifter and Speedy-Cube Release, 12 lbs.—108 ice cubes. New, flat, disc-type Kelvin Control. Vegetable Bin. Polarsphere sealed unit. Kelvinator's price only **$239.95***

For 1940 Kelvinator Presents The Electric Range That Has Everything!

It's New from start to finish! Designed and built by Kelvinator. Has all the features and eye appeal women want in a modern electric range . . . Priced Competitively Low!

Here's the line that "has everything", including all time-proved features, plus extra KELVINATOR EXCLUSIVES that give Kelvinator dealers a big competitive advantage.

WE STARTED from scratch on these big Kelvinators. When we were through building, we had something *absolutely new*. Compare them, feature for feature, with any range on the market. There isn't one that can match them.

Look at Kelvinator's *oversize*, flood-lighted 16" x 16" x 19" oven. Has *two* high-wattage heating units, for fast pre-heating and "even" heat.

And here's a Kelvinator "plus"—a new-type Cooking Timer that eliminates "counting back" to figure out correct setting. In Kelvinator's de luxe model this Cooking Timer controls *three* positions . . . can be connected to oven, Scotch Kettle or appliance outlet. Controls fourth position when Scotch Kettle is installed in drawer.

Each Kelvinator Chromalox surface unit has *five* heats controlled by switch-knobs set in a recessed flood-lighted panel. And each switch-knob has its own "heat signal" light.

Kelvinator household models are built to give maximum rigidity—with one-piece, welded body, vitreous porcelain-on-steel. Finest glass-wool insulation—three inches on top and two on sides, back and bottom. All switches, oven thermostats, built-in timers—front serviced.

Quality features, eye-appeal and competitive prices—all are there to enable Kelvinator dealers to quickly make money in this tremendous, new appliance market.

In a recent national survey, 33.4% of fuel range owners interviewed said their NEXT range would be electric. This shows millions are range prospects *right now*.

The time is ripe for you to get a big piece of this business, with a product that's *years ahead* of competition! Tie in with Kelvinator's big electric range advertising campaign featuring "the range that has everything"—in color ads in national magazines . . . local ads and sales promotion materials.

By itself, Kelvinator's range line fits into any appliance dealer's business. With Kelvinator's refrigerator franchise, it gives you a *double* profit-opportunity! Get all the facts from your nearest distributor or factory branch—or wire or write today to Sales Dept., Range Div., Nash-Kelvinator Corp., Detroit, Mich.

MODEL ER-59. De luxe model, newly designed. Equipped with built-in Cooking Timer combining electric clock, automatic Computing Timer, Signal Light and Minute Minder with 60-minute dial. Kelvinator Selector Switch connecting Cooking Timer with oven, Scotch Kettle or appliance outlet. Automatic Oven Flood-light, individually lighted Switch Knobs in recessed panel. Warming drawer compartment with automatic Temperature Control. Plus all the general features.

EVERY 1940 KELVINATOR HOUSEHOLD RANGE HAS THESE IMPORTANT FEATURES

5-Speed Kelvinator Chromalox Surface Units • Over size two-unit oven • Porcelain enamel on steel cabinet • One-piece welded body construction • 5-Heat bi-rotary, silver contact surface unit switches • "Broil" and "Bake" Pilot Lights • Recessed, slanting switch panel • Utility Drawer • Combination broiling pan with non-tip grille • 6-quart Scotch Kettle • Combination oven switch and thermostat with pre-heat cut-off • Heat-seal, counterbalanced oven door with broil stop.

MODEL ER-49. New design. Has all the de luxe features of the ER-59 except the Automatic Cooking feature. Built-in Minute Minder, Super-Fast 5-Speed Kelvinator Chromalox surface units, individually lighted recessed Switch Knobs, Over-sized Oven with Automatic Flood-light, Warming drawer Appliance Outlet. Plus all general features.

MODEL ER-39. Beautiful new design loaded with features for the woman who wants a high quality range at a moderate cost. Includes all general features plus automatic Oven Flood-light, Cooking Top Light, Appliance Outlet. Super-fast 5-Speed Kelvinator Chromalox surface units and 3 Utility Drawers. Warming drawer, slight extra cost.

MODEL ER-29. Full cabinet model, beautiful new design equipped with Super-Fast 5-Speed Kelvinator Chromalox surface units, "broil" and "bake" Pilot Lights, Has Combination Oven Switch and Thermostat with automatic pre-heat cut-off, Appliance Outlet on wall guard, large Utility Drawer—plus all the other general features.

MODEL ER-19. A low-priced, semi-leg, leader model, with sound selling features including 5-Speed Kelvinator Chromalox Heat-Flo surface units, Utility Drawer, Appliance Outlet, oversized Two-unit Oven with one-piece Porcelain enameled lining, Oven Switch and Thermostat with automatic pre-heat cut-off—plus all other general features.

Kelvinator's New 1940 Washers "The 5-Star Value" Backed by "The 5-Star Program"

Even Hotter than our Champion 1939 line. You know there are no finer features than Kelvinator's Fin-Flex Agitator and Fabric-Saver Wringer with Pressure Pilot. Now imagine how these improved 1940 Products will sell!

IT WAS A TALL ORDER for us to improve on those 1939 Kelvinator Washers that were acknowledged to have as much eye appeal, to be as efficient and quiet as any washer on the market.

But we did it.

And along with this "5-Star Value" we are giving you *the strongest selling story* a dealer ever had—proof of faster, cleaner, safer washing action—all in a ten-minute demonstration any salesman can make. This "5-Star Program" includes newspaper advertising on a liberal cooperative basis . . . printed literature . . . special Point-of-Sale Displays that are new and different . . . made-to-order Promotions and Traffic-Building plans . . . New Big 4 Financing Floor Plan that enables you to put this entire program into operation at once.

Look at the four washers illustrated—they are truly 5-Star Values. Check over these values and you'll agree . . . ★Beautifully styled; finished in gleaming baked Permalux . . . ★Fabric-Saver Wringer with the Pressure Pilot; safe for the user and safe for clothes . . . ★Fin-Flex Agitator that washes faster and cleaner than ever . . . ★Silent-mesh transmission; a really trouble-free mechanism . . . ★The Kelvinator Name; recognized by the public as a standard for dependable quality merchandise.

Here are real values—The 5-Star Values. And there's a model for every budget—each one featured for STEP-UP selling.

What's more . . . there's PLUS profit for you in the Kelvinator prices. There's a full line—with every feature that *sells.*

Look these washers and ironers over carefully. You can see for yourself—that this is the line you can *sell*—at a profit—in 1940.

1940's BIGGEST WASHER VALUE!

Kelvinator Washer Model 9D . . . Beautiful . . . quiet and dependable! Look at these features that prove Kelvinator's superior quality:

★ Fabric-Saver Wringer, balloon type rolls, 4 coil springs. Pressure Pilot shows correct settings for all fabrics. Extra safe with instant action, bar-type pressure release. Has full Underwriters' Laboratory approval.

★ New, improved Fin-Flex Agitator of nickel-chrome protected aluminum . . . cleanest-washing, *gentlest* type designed.

★ Silent-mesh transmission . . . only 5 moving parts . . . oil supply sealed-in . . . so quiet you can't hear it run.

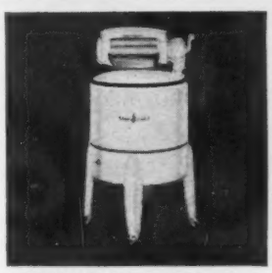
★ Rigid construction, one piece base. White durable, baked Permalux finish.

★ Tub is gleaming white Porcelain Enamel, inside and out. 10 lb. washing load.

★ Automatic timer shows recommended time for washing various materials. Stops machine at predetermined setting.

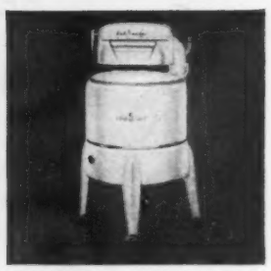
★ Large rubber wheels . . . locking-type Casters . . . foot-control Clutch.

★ Unexcelled value with exclusive features.



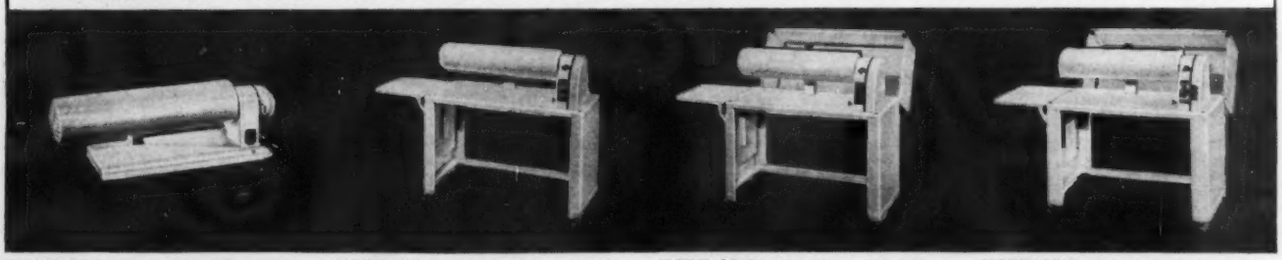
MODEL 5-D—KELVINATOR QUALITY throughout. Bar-Spring Wringer with Balloon-type Rolls and Safety Release on both sides . . . Fin-Flex Agitator . . . 7 lb. washing load . . . Silent-mesh Transmission . . . Tub is white Porcelain Enamel inside and out—white baked Permalux base.

MODEL 7-D—FOR BETTER PERFORMANCE. Fabric-Saver Wringer with Pressure Pilot. Tub is white Porcelain inside and out—8 pounds washing capacity. Base of white baked Permalux. Silent-mesh Transmission with only 5 moving parts sealed in oil. Locking-type Casters.



MODEL 8-D—LARGER CAPACITY. 9 lbs. washing load. White Porcelain Tub. White baked Permalux base. Locking-type Casters. Nickel-chrome protected aluminum, Fin-Flex Agitator. Fabric-Saver Wringer with Pressure Pilot. Silent-mesh Transmission with only 5 moving parts.

KELVINATOR IRONERS FOR 1940—A WORTHY COMPANION LINE TO GET THOSE EXTRA SALES



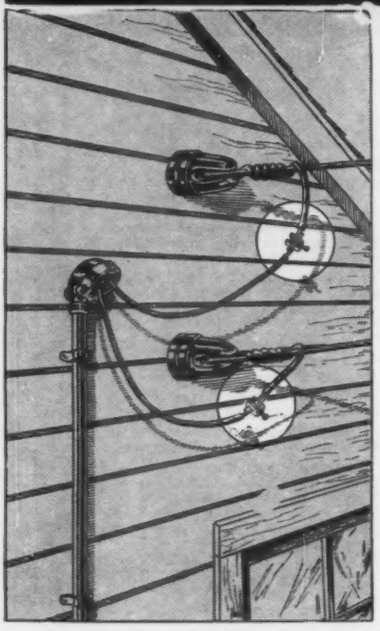
MODEL 30-D. Portable table model. Finished in lustrous white baked Enamel. Has thermostatic Heat Control and pilot light signal to show when current is turned on. Easily operated by finger-tip and foot pressing Controls. Heavily padded roll twenty-one inches long . . . five inches in diameter, both ends open.

MODEL 59-D. White baked Enamel finish. Equipped with flush-type, fold-down Utility Shelf. Selective knee and finger-touch Button Control of shoe operation. Thermostatic Heat Control. Emergency release Lever located on shoe. Has special Ruffler Plate for fancy frills. Mechanism operates in continuous bath of oil.

MODEL 69-D. All white cabinet type. Selective knee and finger-touch Button Control of shoe operation. Equipped with flush-type End Shelf. Emergency Release mechanism located on shoe. Selective thermostatic Heat Control. Special Ruffler Plate on shoe for fancy frills. Mechanism operates in bath of oil.

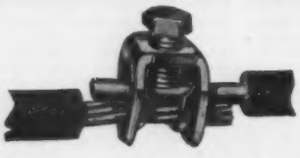
MODEL 89-D. All white de luxe cabinet type. Two-speed motor. Selective knee and finger-touch Button Controls. Hardened steel, chrome plated shoe, with 2 thermostatic Heat Controls. Equipped with flush-type End Shelf. Pilot light shows when heat is on. Special Ruffler Plate for fancy frills. Emergency Release Lever on shoe.

modernize
YOUR DISTRIBUTION PRACTICE—



RELIABLE SERVICE ENTRANCE CONNECTOR

The Service Entrance Connector — first developed by Reliable Electric—now saves the Industry thousands of dollars annually.



Made with a yoke that tends to spring slightly when tightened which locks the threads and eliminates the possibility of shaking loose.

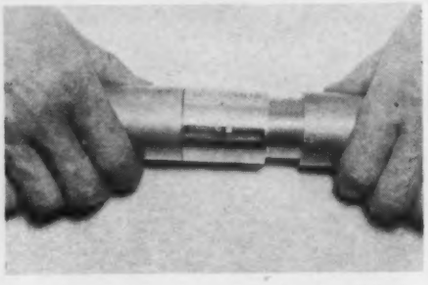
Made also in solid body type

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3143 CARROLL AVENUE CHICAGO, ILLINOIS

NEW PRODUCTS

Connector (101)

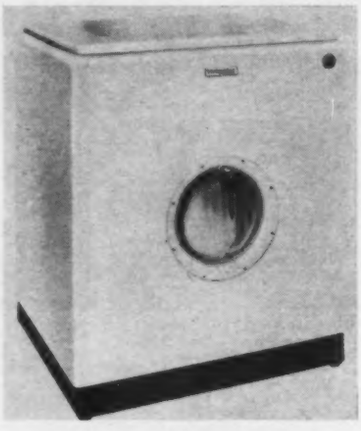
The Nubolt connector, made by the Sheldon Service Corp., embraces a new principle for joining tubular buses. It employs patented internal-expanding wedges to obtain high-pressure contacts on tubing. Wedges are self-locking to prevent loosening due to



vibration, and will withstand a 3-ton pull-out. Tapered key and ordinary hammer are only tools necessary to make or break connections.

Clothes Dryer (102)

The new Hotpoint tumbler clothes dryer dries clothes indoors, in a compact cabinet, by a constant movement of the clothes through clean, warm air. With a capacity of 7 lb. of dry clothes, this model dries clothes in about 15 min. ready for ironing. A ther-



mostat prevents overheating. Electric consumption is 4,600 watts; voltage, 220 volts, at 21 amp. This dryer cannot be plugged into the ordinary house circuit, but requires special wiring. Height is 38¾ in.; width, 33½ in. Shipping weight, 260 lb.

Ultra Violet Device (103)

A new portable a.c. operated, ultraviolet measuring device, useful for measuring the output of various types of ultraviolet sources, is now manufactured by the Westinghouse Lamp Division. Complete meter and carrying case weigh about 30 lb. Photo-tube, grid-glow tube and control condenser are mounted in a separate removable housing and attached to the counter mechanism by an extension cord. On a chromium plate inside the case are the control switch and counter. A full wave rectifier is built into the case.

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Many out-of-town business men use our Bank-by-Mail Service for the advantages which this strong, metropolitan Bank affords. No matter where they live, this service is as convenient to them as the nearest mail box.

Write today...
for free Bank-by-Mail kit containing all necessary forms, return envelope and simple instructions.

CROCKER FIRST NATIONAL BANK
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California's Oldest National Bank

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FOR ANY End to End CONNECTION

Approved by the Underwriters

Save 50% with BLACKBURN "GRIPITS"

Costing only half as much as split bolt connectors, Gripits are more economical for range installations, service entrance connections, and for use wherever wires are connected end to end. Gripits are made completely of Durenze, a silicon bronze actually stronger than steel, and will not stretch or distort when tightened

JASPER BLACKBURN PRODUCTS CORP.
Main and Clinton Sts. St. Louis, Mo.

UNIVERSAL'S

Superheat Unit

FASTEST BY TEST!
The Universal Superheat Unit lets you sell on proof! Simple, dramatic Stop Watch Test proves new unit speed . . . proves new oven speed. Customers convince themselves.

breaks Electric Cooking

SPEED RECORDS

The Nation's

FASTEST...
MOST AUTOMATIC..
MOST ECONOMICAL

ELECTRIC RANGE

NEW Universal Superheat Units are fastest—BY TEST.
NEW Illuminated Magic Eye Oven Control automates old types...Combines all controls in one.
NEW Select-A-Trol permits Timer Control to be used with Convenience Outlet as well as oven.
NEW Multi-I-Heat Surface Controls dial over 101 different heats . . .
NEW, larger Bake-Fast Oven has been PROVED fastest . . . PLUS Quik-Speed Broiling.
NEW Serv-A-Drawer with Serv-A-Tray automatically keeps foods hot and serves direct from range to table.

RANGE SENSATION OF THE YEAR! Breathless new beauty. Thrilling new speed. And—for the first time on any electric range—over 101 different heats for surface cooking!

Here's more! Universal is stepping out with a smashing promotional campaign: National magazine advertising . . . PLUS a tie-in with Modern Kitchen Bureau's program and coast-to-coast newspaper advertising.

Universal's got the range for '40. Universal's got the program. Wire or write for full details today.

NATIONAL ADVERTISING CAMPAIGN
TIE-IN WITH MODERN KITCHEN BUREAU PROGRAM
NEWSPAPER ADVERTISING IN MAJOR MARKETS
COOPERATIVE ADVERTISING
RADIO AND DIRECT MAIL CAMPAIGNS
BILLBOARDS AND WINDOW DISPLAYS
PICTURE FILMS AND VISUALIZERS
UNIVERSAL UNIVERSITY SALES TRAINING COURSE

Universal ELECTRIC RANGE

Made by LANDERS, FRARY & CLARK, New Britain, Conn.

CHROMALOX
ELECTRIC RANGE UNITS
have
two cooking areas
thus do not waste heat in use of small utensils. Many other exclusive features that help you to
sell CHROMALOX equipped ranges

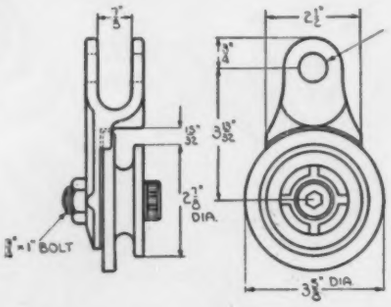
REPRESENTED by
MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
420 S. San Pedro St., Los Angeles, Calif.
THE PETERSON COMPANY
1921 Blake St., Denver, Colo.
EDWIN L. WIEGAND CO.
7540 Thomas Blvd., Pittsburgh, Pa.

Correction

In a recent new product announcement on a Steem-Electric iron, Continental Sales Co. is the correct name of the distributor, instead of Consolidated Sales. Fred Wood is manufacturers' agent for Steem-Electric, with headquarters in San Francisco.

Pulley (104)

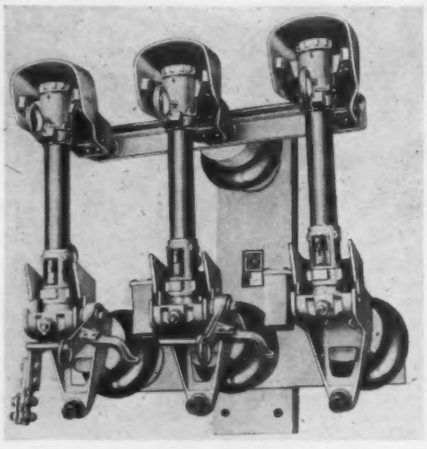
An angle-type wire-stringing pulley has been developed by Hubbard & Co. for use in connection with all swinging insulators. It is particularly adapted to sagging angles of from 30 to 60 degrees. When in place, the conductor fits the sheave in the identical



position it maintains when later permanently clamped in place. The clevis is designed to fit over the eye of a small disc insulator of eye bolt. Both body and sheave are malleable, with surfaces smooth.

Cutouts (105)

A heavy duty series of Semafor single and reclosing cutouts for use when load currents and possible short circuit currents are beyond the capacity for the existing types, has been introduced by Schweitzer & Conrad, Inc. Design follows the standard Semafor line, but



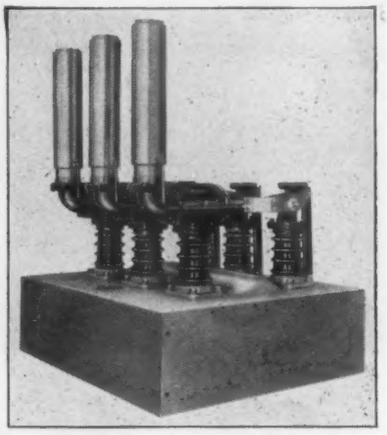
these cutouts are larger, heavier, and are fused with a new heavy-duty fuse link. Type illustrated is 3-shot reclosing cutout, rated at 7,500 volts, 200 amp.

Swing-Link (106)

To provide a flexible support with high slip strength for ground wires, the Ohio Brass Co. has developed a new type of bracket, the Swing-Link. Main body casting has a groove on the outer side which holds a link at a distance of 3 in. from the pole. The link, in turn, supports a regular suspension clamp for holding the ground wire. Since the link is free to swing on the bracket proper, and there is a flexible connection between the link and suspension clamp, the device allows a ground wire to swing through a wide arc laterally, thus preventing damage to a wire when it is swayed by wind. By employing a regular suspension clamp to hold the ground wire, high slip strengths can be developed.

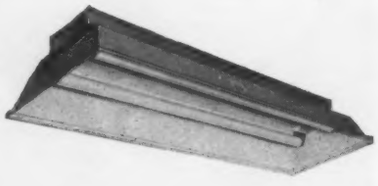
Circuit Breaker (107)

A new oil-less circuit breaker, which uses the prestered energy of compressed air for the two-fold function of breaker operation and arc interruption, has been introduced by Allis-Chalmers Mfg. Co. Designated as type AB-15-500m this unit consists essentially of an air storage tank containing compressed air, a main air-blast valve, three interrupting chambers mounted on hollow insulator



support, three exhaust mufflers or coolers integrally mounted with the interrupting chambers, and isolating contacts connected in series with the interrupting chambers, also mounted on insulator supports.

Fluorescent Fixture (108)



Latest development in fluorescent lighting for industrial and commercial purposes is the establishment of an RLM specification for a new 48 in. Fluorescent Twin Lamp Pocelain Enamel Unit. Light output efficiency is set at 78%; a cut-off angle of 17½ degrees and closed ends minimize glare; removable and renewable starting switches located in the socket facilitate inspection and maintenance. These new units were made available Jan. 1. New specifications have been published giving complete information about the unit.

Immersion Unit (109)

An important modification of the Trent line of IR Junior Electric Immersion units, which consists of the standard unit with gas tight head, is shown here. Unit ratings are from 300 to 1,500 watts, 115 or 230 volts,

single or three heat. The casings are made of seamless brass, copper, steel or chrome steel.

Pantographic Machine (110)

A bench type pantographic machine for general industrial engraving work on all materials, and electric etching on soft or hardened steel, is presented by H. P. Preis Engraving Machine Co. Separate heads quickly interchangeable, are used for the two classes of work. On engraving work, depth of cut is controlled, independent of the depth of master characters, by a micrometer adjustment mechanism on the engraving head. An electrical transformer provides three or more voltage stages for various depths of marking.

Condensers (111)

With capacities ranging from two to 50 tons, 16 new models of evaporative condensers have been developed by the air conditioning and commercial refrigeration department of General Electric at Bloomfield, N. J. The two to five-ton units are of the propellor-fan type and are arranged for either floor or ceiling mounting, while the larger sizes utilize centrifugal fans and can be installed either indoors or out.

Panelboards (112)

New oil-immersed panelboards, using thermal trip branch circuit breakers, for the protection of lighting circuits in locations exposed to corrosive elements and explosion hazards, have been introduced by Westinghouse. The new breaker has a compensating bimetal mounted outside the chamber of the breaker frame in which the main tripping bimetal is enclosed. This is affected only by the general temperature of the whole tank of oil. Its motion is transmitted to the tripping bimetal through a link, thermally and electrically insulating the two members and passing through a small clearance opening in the breaker wall.

Connector (113)

Where an easily taped connector of excellent electrical properties is required, the "Streamlined" electrical connector manufactured by the Burndy Engineering Co. is available. All corners and edges are carefully rounded and the bolt heads are sunk in sock-

ets to facilitate taping. This same general type of construction is also available for couplers, terminals, stud connectors, and other shaped connectors for tube or cable.

Coffee-Tea Maker (114)

A single unit that is both a decorated Silex Glass Coffee Maker and a decorated model Spray Tea Maker has been introduced by the Silex Co. This new unit is furnished with a special vented upper bowl and a vent hole closure. With the unit are included both a Silex Coffee Filter and a Silex Tea Spray. By closing the vent hole and using the filter,

housewives have a coffee maker, and likewise by closing the vent hole and using the tea spray, a tea maker is ready for use. Ten cup sizes and red and ivory trimmed models are slightly higher in price.

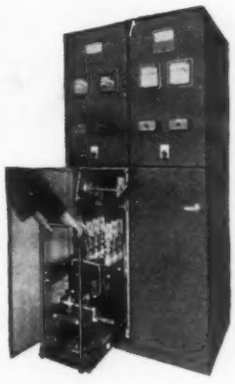
For Better Service—
INSTALL TRICO
REG. U.S. PAT. OFF.

RENEWABLE FUSES
With the famous *powder-packed* element
KANTARK "ONE-TIME" FUSES
With genuine fibre tubes (not paper)
COLORTOP PLUG FUSES
Color tells the size
TRICOMATIC PLUG FUSES
With built-in thermal time-lag element
KLIPLOK CLAMPS
Lock fuses and clips together
TEST CLAMPS
For heavy duty testing
FUSE PULLERS
For safe handling of fuses
AUTOMATIC OILERS
For motors, line shafts, etc.

Send for your new Folder CPF-300 TODAY!
TRICO FUSE MFG. CO., MILWAUKEE, WIS.
M. L. Woodard, 367 9th St., San Francisco
W. E. Young Co., 1944 Broadway, Denver

TRICO POWDER PACKED FUSES
STOP WASTED KILOWATTS AND WASTEFUL SHUTDOWNS

ROLLER-SMITH
METAL-CLAD SWITCHGEAR
Moderate Duty, Vertical Lift



Here is a development by Roller-Smith to meet the call for adequate and economical control of generators and distribution facilities of central stations, industrial plants, office buildings, hospitals and similar institutions . . . with services of 5,000 volts or less at interrupting capacities of 25,000 and 50,000 KVA.

Engineers will be interested in the features of flexibility to meet, exactly, a wide variety of standard conditions and its easy adaption to special requirements. These are fully presented in the new Roller-Smith Catalog 8-b.

A copy of this special catalog gives illustrations, dimensional data, circuit arrangements and full specifications for indoor services.

Send for your copy of NEW Catalog P-8-b

ROLLER-SMITH COMPANY
Electrical Measuring and Protective Apparatus

MAIN OFFICE AND WORKS:
BETHLEHEM, PA., U.S.A.

Sales Agencies in Principal Cities in United States and Canada

to compare anchor installation costs

$2.45 approximate cost INSTALLED complete with rod

The time element plays an important part in the cost of anchor installations. Compare the installation time of the Dual Never-Creep with the time required to install a treated log, concrete or scrap iron dead man, add the cost of anchors and rods, compare the efficiency of all types and the answer is simply this: Dual Never-Creep Anchors are sound investments that save you time and money.

The calculation above for installing the No. 1110 Dual Never-Creep is based on actual conditions checked by time studies figuring a wage scale of $4.40 per day for labor. These studies reveal that on an average, a Dual Never-Creep Anchor can be installed by one man in less than 30 minutes using an 8-in. auger. Hole boring machines will reduce this installation time to less than half.

Where it is impossible to bore holes, the Dual Never-Creep may be installed as a dead man using either a threaded or Never-Creep rod and give you extra protection against deterioration.

When installed, the Dual Never-Creep Anchor pulls 100% against solid earth. There is no danger of slipping or creeping. Time tests taken over a period of years, prove the superior holding power and long life of Never-Creep Anchors.

It pays to use this quicker, easier to install, more efficient type of anchoring.

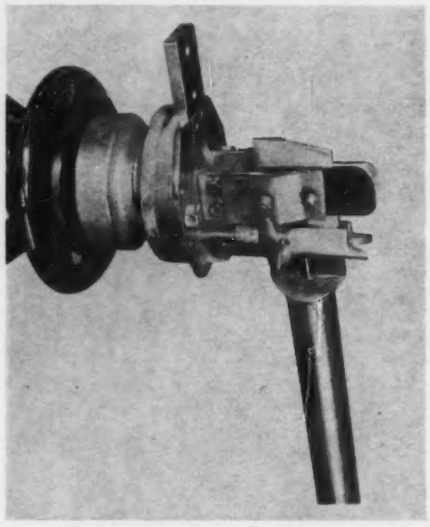
Cat. No.	Size	Area	Weight	Price less rods
1110	7"x16¼"	110 sq. in.	14½ lbs.	$1.29
1125	7¾"x16 13/16"	125 sq. in.	19½ lbs.	1.47
1140	8"x18 5/16"	140 sq. in.	24 lbs.	1.70
1176	10"x17⅝"	176 sq. in.	27½ lbs.	2.10
1322	13"x23⅝"	322 sq. in.	60 lbs.	4.98

Distributed by G. E. Supply Corp

A·B·CHANCE CO. CENTRALIA MISSOURI

Discounts (116)

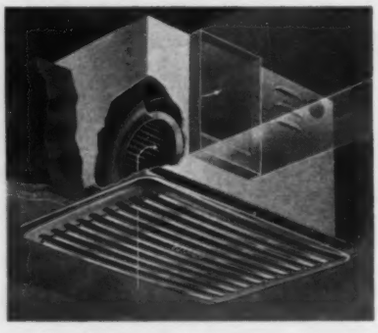
A simple arrangement for applying high pressure between clip and blade after relative motion has ceased, is now being incorporated in Type GM disconnects by Bowie Switch Co. In the blade end is a rotary cam, actuated by a torsion rod contained in the blade. The cam transmits motion through two



pairs of levers to pressure springs. By delaying this action until blade-motion ceases, use of silver contacts is feasible without abraiding. Both hinge and high-pressure end are protected against sleet. Gang operated units, 69-kv., 600-amp., are being installed at Bonneville.

Blower (117)

A compact "Clipper" blower manufactured by Trade-Wind Motorfans, Inc., assures quick removal of cooking smoke and odorous vapors from the kitchen range, eliminating greasy film on ceiling and walls. This unit may be obtained in either a horizontal or vertical



duct. The blower "Squirrel-Cage" wheel is self cleaning of grease by centrifugal action. Motor is induction type, oversized for the load and will not cause radio interference.

Blue Print Machine (118)

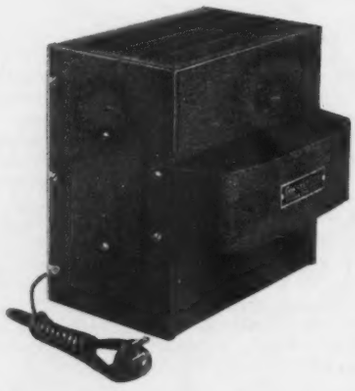
A completely new type blue print machine, embodying the use of the new high pressure mercury quartz lamp, will be ready for the market by Jan. 1, according to the Charles Bruning Co. Test runs on a model of this machine have been made at a speed of 20 ft. per min. from new pencil and ink tracings using medium speed blue print paper. The new quartz lamp gives positive uniform distribution of light to the entire printing surface without flickering and eliminates the necessity of changing and trimming carbons.

Fluorescent Unit (119)

The first fluorescent lighting unit to be approved by the Fleur-O-Lier Manufacturers Assn. is the Brigadier, introduced by the Wakefield Brass Co., and suitable for office, store and school installations. It is especially applicable where higher lighting intensities are desired. This unit consumes only 160 watts in its four fluorescent tubes. It has an all-steel, electrically-welded frame in which are inserted sheets of translucent plastic.

Battery Replacement (120)

Connectapower is a new battery replacement unit for private telephone and signal systems now offered by the Connecticut Telephone & Electric Corp. It plugs into the lighting circuit (110 or 220 volt a.c.) and provides power output in various low voltages for talking and ringing circuits for



telephones, bells, annunciators, etc. It is housed in a metal cabinet, finished in black crackle-baked enamel and is designed for surface-wall mounting.

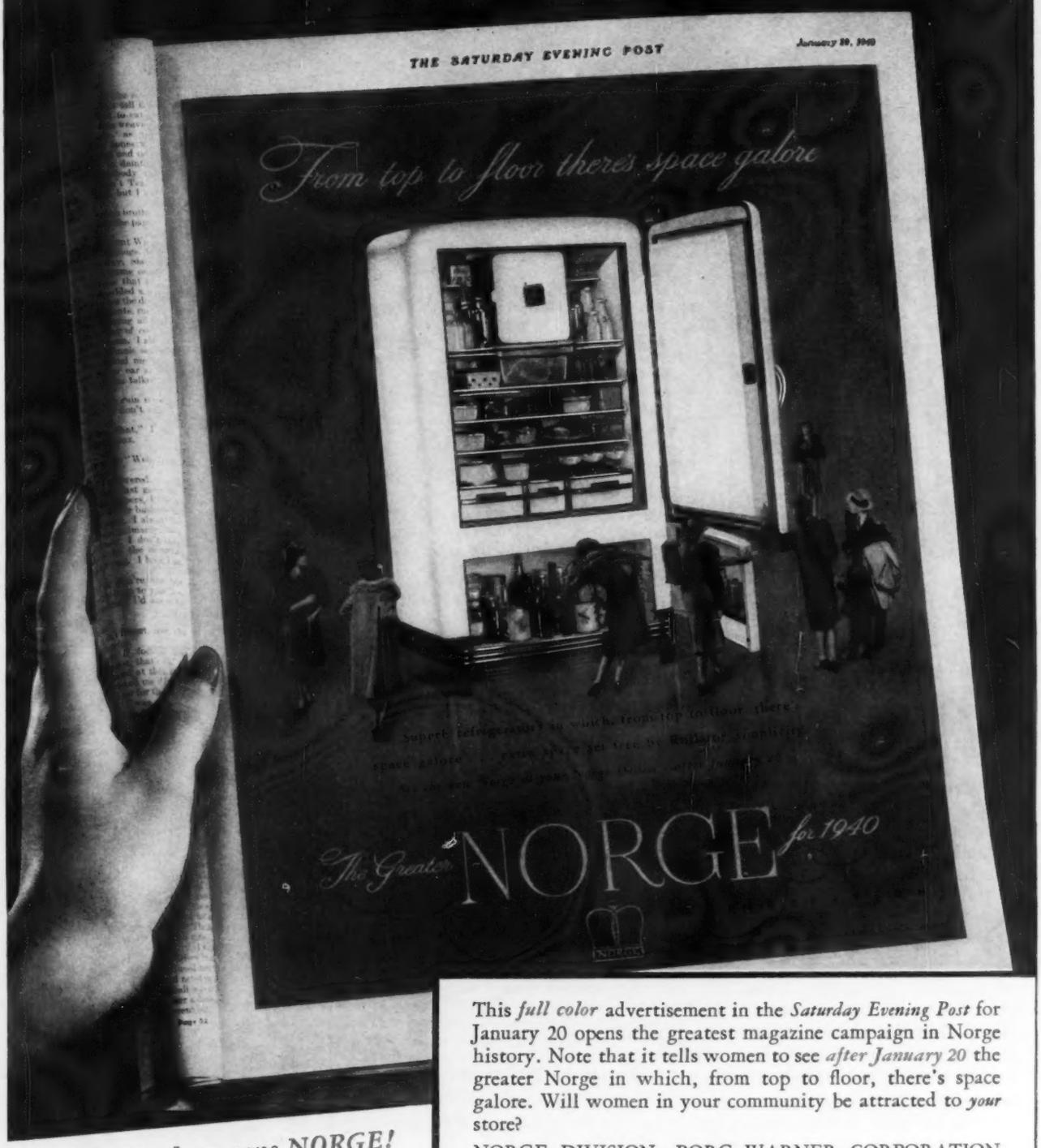
Sun Lamp (121)

A lighter and more efficient sun lamp has been developed by G-E. Employing the new type S-4 Mazda sunlight bulb, the lamp is available either with or without a timer to regulate the sunbathing periods. The bulb is of an entirely new design, being of the high-pressure mercury type but with patented improvements to increase its operating efficiency. It uses but 120 watts total. Color of the light is blue-green rather than white. Under average home use, the S-4 bulb will give more than a year of satisfactory service.

Footometer (122)

For use in measuring distances on foot, where an automobile attachment is not practical. Speedometer Service Co. is now manufacturing a new Push Model Survey Footometer. It registers accurately from 1 to 100,000 ft., and can be reset to zero instantly. The measuring device is driven direct from the wheel, without internal gears. Weighing less than ten lb. it is easy to carry when not being used. Survey Footometer equipment is used by public utilities taking inventories, engineers, highway and farm surveyors, and outdoor advertising agencies.

Will this be *your* advertisement?



Many dealers have gone NORGE!

There still may be an opening in your community . . . an opportunity to be with Norge in 1940. For complete information, wire or

Sign and mail the coupon today!

This *full color* advertisement in the *Saturday Evening Post* for January 20 opens the greatest magazine campaign in Norge history. Note that it tells women to see *after January 20* the greater Norge in which, from top to floor, there's space galore. Will women in your community be attracted to *your* store?

NORGE DIVISION, BORG-WARNER CORPORATION
670 East Woodbridge, Detroit, Mich.

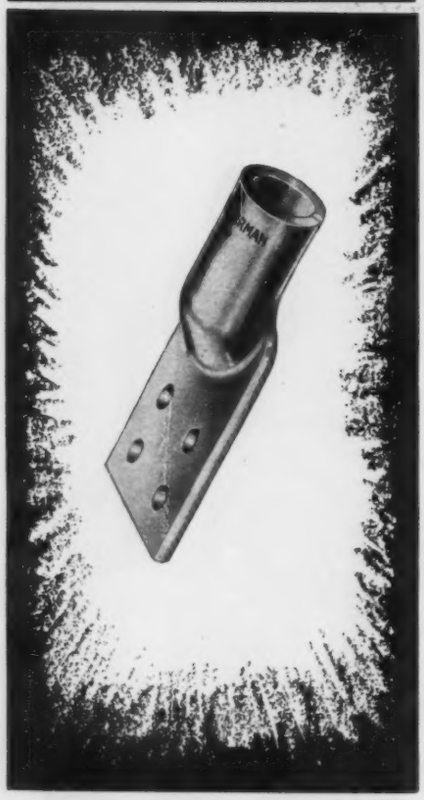
Without obligating me in any way, let me have complete information about Norge for 1940.

Name_____

Address_____

City_____ State_____

EW-102



This Sherman Heavy Duty Lug is really a tough customer. It has the strength, weight, and construction to do the hard jobs — handle the big loads. Complies fully with Nema-Nela standards for heavy duty service, and carries refinements that are typically Sherman.

A precision made lug, free from defects, with contact surfaces that are truly flat. Fully interchangeable with corresponding cast lugs. Write for bulletin.

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICH.

Sherman
HEAVY DUTY
LUGS

PRODUCT DATA

Portable Instruments (123)

Portable instruments, a. c. and d. c., are outlined and discussed in a new 28-page G-E booklet. Various types such as voltmeters, ammeters, milliameters, of the pocket-size variety are presented. Full details, illustrations, table and charts tell a complete story on this equipment. Accessories such as current transformers, shunts and portable multipliers are also included.

Cable Lines (124)

In the fall edition of INCO, a publication of the International Nickel Co., an article, "Loss of Electric Power Eliminated by Metal Tapes," is interesting and instructive. It shows how power transmission cable lines are wrapped with corrosion-resistant alloy as protection against failure, even at voltages up to 35,000 volts.

Rectifiers (125)

A mercury arc rectifier bulletin has been issued by Allis-Chalmers, describing and illustrating their standard multi-anode rectifiers. It provides information on their recently announced Excitron single-anode rectifiers, particularly suited for the lower voltage applications from 250 to 300 volts. In addition to outlining the numerous advantages of this type of conversion equipment, it includes many shop and installation views, sections and performance data

Grinders (126)

Hi-speed, heavy-duty tool post and pedestal mounted grinders, and a complete line of aerial models are covered in a catalog issued by Sawyer Electrical Mfg. Co. Sanders, hi-power rotors and stators are included. Full information is also given on Sawyer master pressure blowers, volume blowers, a portable submersible pump.

Demand Meters (127)

Indicating demand meters that result from combining new registers and special covers with the standard watthour meters are covered in a new 48-page booklet by Westinghouse. Dimensions, prices and application data are included, and a listing of available portable testing devices.

Fire-fighting (128)

Realizing the danger to be encountered by those fighting fires in electrical equipment or handling hose streams coming in contact with high voltage electric lines, chief engineer George W. Booth, National Board of Fire Underwriters, presents precautionary measures in Bulletin No. 91, "Fire Streams and High Tension Electric Lines." Tables of distance which a nozzle should be kept from the electrical line or device are given.

BIGGER PROFITS
BETTER PRODUCTS

1. **Wire-Nuts.** — "Solderless — tapeless Wire Connectors." Skin wires—Screw on — **That's All! One size** for all common wiring joints. Fully Approved. MILLIONS IN USE!

2. **"E-Z" Wire Strippers.** — Strips the **toughest** insulations without nicking or cutting strands. Strips solid or stranded wires from No. 30 gauge to No. 5.

3. **Cable Ripper.** — Easily and quickly rips non - metallic sheathed duplex or lead covered cable.

4. **Joist Boring Machine.**—Ends tiresome and dangerous reaching. Bores at any angle—reaches up to 11 ft.

5. **Fuse Clip Clamps.**—For Ferrule or Knife type clips. Seven sizes.

6. **Fish Tape, Reel & Puller.**—NOW fishing IS a pleasure. Keeps tape reeled up—no expensive tape breakage — no "live" contacts. NEW! "Junior No. 0" size—$2.50. Easily fits in tool kit.

7. **Test - Lite & Fuse Puller.**—Tests live circuits. Pulls fuses.

8. **Fuse Reducers.** — Stop over fusing. Many sizes.

9. **Fuse Pullers.** — Laminated fibre, four sizes.

IDEAL SOLD THROUGH JOBBERS

Electrical Products Division
IDEAL COMMUTATOR DRESSER COMPANY
1042 PARK AVENUE SYCAMORE, ILLINOIS

PAINE *Improved* Cable Clamp
For use on cross arms, overhead beams, etc. Paine patented slot permits rapid installation . . . no fumbling or guesswork . . . slip the bolt with the nut already on into the slot and tighten. Lag screw is gimlet pointed and securely riveted to the clamp . . . clamp is galvanized for rust and weather resistance.

PAINE PIPE STRAP
Prominent center rib adds extra strength, assuring maximum holding power. Uniform gauge materials, accurately punched. Snug, form fitting, and free from sharp ends and burrs. Packed in 5 and 25 lb. cartons and 50 or 100 lb. bags with 3% over weight to assure full measure.

ONE AND TWO HOLE ROMEX STRAPS

ROMEX STRAP
One and Two Hole straps for sheathed cable. Extra strength center rib, smoothly finished.

PIPE STRAP

PAINE

THE PAINE COMPANY
2975 Carroll Ave. Chicago, Ill.
Western Warehouse and Sales in
Los Angeles, Seattle, San Francisco, Denver

SQUARE D MULTI-BREAKERS IN AMERICA'S LARGEST PRIVATELY OWNED COMMUNITY OF LOW RENTAL HOMES★★

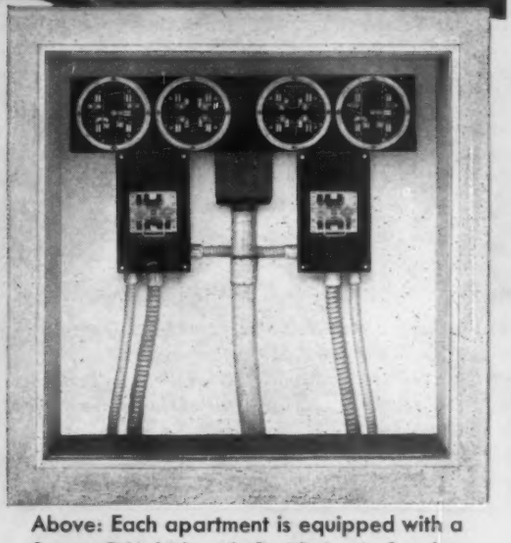
Above: The Wyvernwood Community in Los Angeles is three-quarters of a mile wide. 148 buildings will accommodate 1102 families.

At Right: Typical building. Architecture is modern and plot layout provides large open areas for adequate natural light and air. Apartments will rent from $25 to $45 per month, depending on location and size.

● An outstanding feature of this unusual community development is the electrical conveniences provided. Electric water heaters, electric refrigerators and electric bathroom heaters are "standard equipment" throughout. In addition, most of the apartments are equipped with electric ranges.

Significantly, a Square D Multi-breakeR is the service entrance equipment for every apartment. Thus, Wyvernwood residents will enjoy modern protection against dangerous overloads—will be forever free of the inconvenience and annoyance of changing fuses.

Whether it's a modest cottage, costly home, or modern apartment—whether it's one, a dozen, or a hundred—the Square D Multi-breakeR lays the foundation for better and more profitable wiring jobs—paves the way for more outlets and appliances.



Above: Each apartment is equipped with a Square D Multi-breakeR with circuits for electric range, electric water heater, and lighting. Each installation has a master meter and a sub-meter for the water heater. Square D meter trough is used for a neat wiring job.

SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

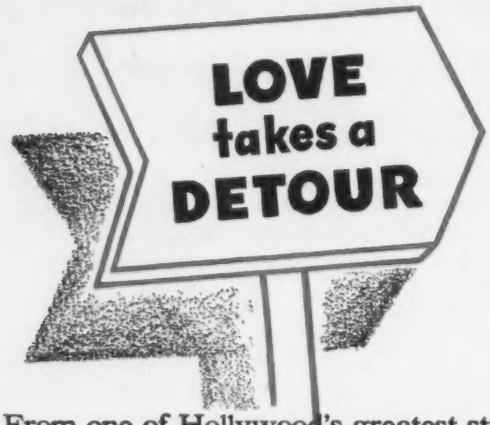
CALL IN A SQUARE D MAN

CROWNING 30 YEARS OF LEADERSHIP

Hotpoint Presents

THE ARISTOCRAT—*Beautiful new Hotpoint model in gleaming white porcelain enamel. Smartly styled for the kitchen of tomorrow.*

The Greatest Range Promotion Ever Offered



From one of Hollywood's greatest studios, produced with a star-studded Hollywood cast, Hotpoint brings you this brilliant new motion picture success to send your sales soaring in 1940. It's the smash-hit headliner of the greatest promotional program in Hotpoint history. Don't wait—plan now your local showing of "Love Takes a Detour." Make full use of its dramatic sales punch. Hotpoint furnishes the complete plan and material. Write now for full details.

4 Reasons Why Hotpoint Means More Business for You in 1940

1 NEW MODELS—AT LOWEST PRICES EVER OFFERED FOR SUCH QUALITY

Don't take chances—show the *complete* Hotpoint line and win value-wise buyers from every price bracket. There's a brilliant new Hotpoint model for every need—at the lowest prices ever offered for such quality. Cash in on the exciting new beauty of the complete Hotpoint line.

2 NEW FEATURES MEAN NEW SALES POINTS

You'll win *more* sales... easier... faster... with the wealth of dramatic, exciting features Hotpoint has packed into every model of the 1940 line. Here is sales power to pull new thousands of prospects into your store—build profit volume every day of the year! See the complete line today!

3 NEW IMPROVEMENTS MEAN POWERFUL SALES COMPARISONS

Compare Hotpoint's brilliant beauty and breath-taking new features, point by point, with any other line on the market. See what a tremendous advantage Hotpoint's amazing improvements give you in the race for sales. Let Hotpoint work for you right from the starting gun—now!

4 THE MOST AGGRESSIVE SALES CAMPAIGN IN HOTPOINT HISTORY

Hotpoint is ready to put you out in front with a sensational program of Dramatized Promotion including national advertising, direct mail, retail contest material and a brilliant, Hollywood-produced motion picture. All these and other helps spell PROFIT for you throughout the year.

Hotpoint ELECTRIC RANGES

WATER HEATERS · WASHERS AND IRONERS

A great new line of Ranges and a great New Calrod

NEW CALROD

Is Faster, More Efficient, More Durable Than Ever. Less Wattage—Lower Operating Cost

Hotpoint gives you the greatest electric range selling feature of the year — sends a vast new army of interested buyers to your door — with sensational new "self-cleaning" Calrod coils actually faster, more efficient and more durable than ever before!

And — more amazing still — with all its vastly improved performance, the new Calrod shatters all former records for economy, using less current than ever!

Here's a star, right out of the Hotpoint laboratories, that has the dollar sign of profit tied to it! Tie to it, too, right now! Let the new Calrod, and Hotpoint's brilliant new line of electric ranges for 1940, pull your sales to the greatest heights they've ever known!

NEW HI-SPEED CALROD—*Faster starting, more efficient, more durable than ever before—yet uses less current! Cash in on this sensational new feature—the greatest electric range innovation of the year.*

Simply lift the Calrod unit and the reflector "pops" out for quick, easy cleaning. No tools, no struggle, no "messin' around." A sure-fire hit with women.

Easy to clean—normal spillage quickly consumed in the glowi heat of the self-cleaning coi Should excessive spillage occur, t reflector can be quickly remove

EDISON GENERAL ELECTRIC APPLIANCE CO., In
5612 West Taylor Street, Chicago, Illinois

CROWNING 30 YEARS OF LEADERSHIP

REFRIGERATORS

ELECTRIC DISHWASHER-SINKS

Aerovox Manual (129)

Of utmost practical value to designer, manufacturer, or serviceman dealing with motor-starting capacitors is the Aerovox Industrial Capacitors manual just issued by Aerovox Corp. Several pages are devoted to pertinent information on motor-starting capacitors, including diagrams, curves, formulae, specifications, tables and a self-calculating graph of electrical characteristics. These are followed by an alphabetical listing of standard motor brands and types, with their required capacitors listed by capacity, a. c. voltage, dimensions, construction, illustration and list price.

Capacitors (130)

"Replacement Motor Starting Capacitors" is the title of a bulletin just issued by the Cornell-Dubilier Electric Corp. The book lists exact duplicate replacement capacitors for all types of a. c. motor driven equipment from air-conditioning down to water systems.

Switchboard (131)

A complete line of rectangular switchboard instruments is covered in a 12-page G-E publication which outlines 10 outstanding advantages of this equipment, gives construction features, operating principles and accuracy figures. Various listings, dimensions and scales in actual size are included.

Miralumes (132)

Two new folders, describing, illustrating and giving specifications of Fluorescent Miralumes, are presented by the Hygrade Sylvania Corp. One of these units is designed for industrial use, while the other is for general commercial use, such as in stores, and offices. Each is ready to use, and is delivered complete with wiring circuits and lamps. These "packages of fluorescent sunlight" are ready to hang up and plug in.

Ideal Catalog (133)

A new catalog by the Ideal Commutator Dresser Co. is available, showing the company's complete line of industrial equipment. Cleaners, electric-soldering tools, electric-marking tools, wire strippers, fuse specialties, coil-winding equipment, undercutters and motor bases are included in this publication.

Oil-circuit Breakers (134)

A new leaflet on moderate-capacity, switchboard-type, oil-circuit breakers with all three poles in one tank, has been issued by Allis-Chalmers. These breakers are capable of wide application to central station and industrial service where economy and space are important factors.

Cable Digest (135)

"Cable Digest," a condensed guide to aid in the selection of insulated cable for low-voltage power circuits, is now being issued by General Electric. Summary of types and applications, details of types, including prices, and how to select conductor sizes make up the contents of this 18-page publication.

Regulators (136)

In a 16-page booklet just published, General Electric discusses diactor generator-voltage regulators, type GDA for a. c. machines. General descriptions, construction and design are outlined together with mounting, installation and operation methods. Fundamental requirements of parallel operation are also included.

Bustribution (137)

"Bustribution" systems of the Bull Dog Electric Products Co. are presented in a compact 8-page booklet, which explains this electrical distribution method that provides movable and flexible power circuits. A typical electrical distribution layout is diagrammed and discussed. Illustrations of equipment are also given.

Underground (138)

Underground equipment, designed for new trends in underground distribution, is the subject of an illustrative folder by the Burndy Engineering Co. Pictures of Burndy Mole Line installations are shown; advantages are presented, and part of the line is presented pictorially on the concluding page.

Capacitors (139)

Pyranol distribution capacitors, of the housed-pole type for 2,300 to 13,200 volt circuits, are presented in an 8-page bulletin by General Electric. Flexibility of rating, housings, application, prices and dimensions are given together with diagrams.

Rural Transformers (140)

A new bulletin on Rural-Line Transformers has been issued by Wagner Electric Corp. This 8-page publication contains information of particular value to anyone engaged in rural electrification work. Connection diagrams, information on the care and operation of rural-line transformers and other valuable data are offered.

LOOK AND LISTEN, THE TELEVISION HANDBOOK—A set and serviceman's manual by M. B. Sleeper, Norman W. Henley Publishing Co., $1. This complete handbook, describing 1939 television practice for service men, set builders and students, includes detailed instructions for building an Andrea sight-and-sound receiver. Eight chapters cover the immense field of television, from its earliest beginnings to installation of the present day models. A dictionary of television terms will aid the beginner in the language of the industry. Illustrations will assist even the layman in understanding the development of this newly-created field.

INCANDESCENT ELECTRIC LAMPS is the subject of a United States Tariff Commission Report recently issued. This 154-page book is the result of a survey of the production of incandescent electric lamps and glass bulbs in the principal producing countries, processes of manufacture, marketing, and industrial agreements, with special reference to international trade and tariff considerations. For sale by the Superintendent of Documents, Washington, D. C., 25c.

INDUSTRIAL HEALTH, by C. O. Sappington, Industrial Commentaries, Chicago, $3.75. Whether industrial health is an asset or a liability is discussed in this 224 page book, which covers such subjects as "The Administration of Industrial Health," "The Philosophy of Health," "Fundamentals of an Ideal Service," etc. In a special section, examination forms and industrial survey forms are included. The author is a former director of industrial health, National Safety Council.

SAVE TIME! USE THIS COUPON

To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:

ELECTRICAL WEST, 68 Post St., San Francisco, California
Please send me the following CIRCLED items:

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140

Name ..... Title* .....

Company* .....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

FRIGIDAIRE

Good as Gold for '40

● Frigidaire, America's No. 1 Refrigerator, leads again! There's a bit of selling magic in its thrilling new features . . . a touch of genius in its exciting new beauty. It's the crowning achievement of a score of Frigidaire successes. A sales-making, profit-making champion like you've never seen before! We say it, and all America will shout it: "It's Frigidaire for '40"!

Soon it can be told. This month, Frigidaire is unveiling the refrigerator sales leader of the year, the new 1940 Frigidaire with the Meter-Miser. Expect to see something startling in its departure from conventional practice. Let your eyes confirm what words alone cannot reveal. Simultaneously announced will be Frigidaire's beautiful companions, the new and farther advanced Frigidaire Electric Range—sensation of the industry—and the new Frigidaire Electric Water Heater, literally brimming with sales appeal.

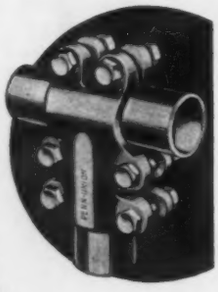
Make no mistake. Frigidaire Dealers, kingpins of the industry, will again have an unbeatable combination of products and selling advantages this coming year. Their profits will mount, as sales volume swells. No idle promises these, for the path is charted, the way is clear. The opportunities of Frigidaire Dealers are "good as gold" in '40!

FRIGIDAIRE DIVISION • GENERAL MOTORS SALES CORPORATION
DAYTON, OHIO

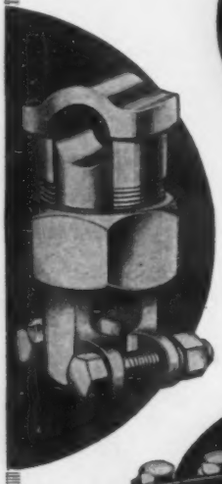
ALL Kinds of Fittings—

for every type of electrical connection. For any combination of tube, bar, cable, or wire.

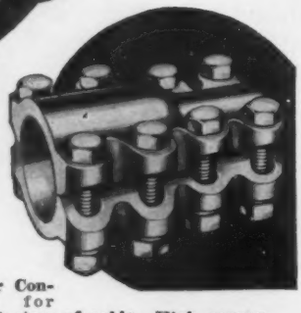
More than 6,200 items.



Clamp Type Tees in all sizes. High copper alloy; machined contact surfaces



Self-Locking Tees that hold permanently tight. With and without extension.



Reducer Connectors for different sizes of cable. High copper with Everdur bolts, nuts, lockwashers.

You will be interested in the many NEW and IMPROVED fittings in the Penn-Union Catalog. Every item thoroughly tested, Dependable.

NICHOLAS & COOK
1063 HOWARD STREET
SAN FRANCISCO

J. W. WATKINS
538 SKINNER BLDG.
SEATTLE

PENN-UNION ELECTRIC CORP., Erie, Pa.

You'll find it in the *complete* line

PENN-UNION
Conductor Fittings

LETTERS

Brainstorm

DEAR SIRS:

The October, 1935 issue of ELECTRICAL WEST suggested, under the heading "Business Building Brainstorms," a less expensive smaller, low-wattage hotbed cable and thermostat, and also a low-wattage cable for home growers.

Enclosed is our new retail price list showing a 200-watt heating cable and a 300-watt thermostat which makes at unit for home use ready to plug in a light socket and retailing for $4 complete. This cable has been tested for over a year in service by growers, with favorable results.

I thought you would be interested in knowing that one of the "Business Building Brainstorms" has produced results.

L. N. ROBERSON
1540 E. 102nd Street
Seattle, Wash.

Dignity

DEAR SIRS:

I read with much interest your Nov. issue, particularly "Electra's Husband" on the suggestion to "Peglerize the Language." Someone certainly hit the nail on the head in the right hand corner of that page starting, "Then I exploded. 'Dignity!' . . ."

You have no idea of how much of that I have found as I have traveled around through the industry; in fact, you have no idea how many times Reddy Kilowatt has been turned down because he was "undignified."

I am enclosing a copy of our recent issue, "The Worker with a Thousand Jobs," in which you will note that character's idea of dignity. I could not help reacting to this good article of yours.

ASHTON B. COLLINS
Webb Crawford Bldg.
Birmingham, Ala.

Which List?

DEAR SIRS:

. . . Some years ago the American Institute of Electrical Engineers published a pamphlet titled "AIEE Manuscripts and Discussions—Rules Governing Preparation, Presentation, Publication," which contains, among other things, an approved list of abbreviations.

Would it not be proper, at least as far as those abbreviations definitely pertaining to electrical engineering are concerned, to follow those approved by AIEE?

PAUL LEBENBAUM
Electrical Engineer
Southern Pacific Co.
San Francisco, Calif.

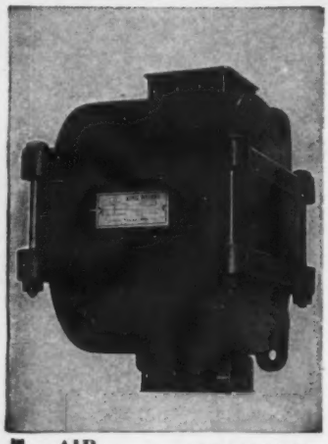
Tickled Pink

DEAR SIRS:

". . . about Electra's Husband in December, the fact that the automobile industry's methods were pointed out as being a model for other industries to follow, just tickles as pink. . . ."

WILLIAM MCGAUGHEY
Automobile Manufacturers Assn.
Detroit, Mich.

YOU SAVE



With JEFFRIES

AIR COOLED TRANSFORMERS

● With a Jeffries Air Cooled Transformer money can be saved. The Air Cooled construction lengthens the life of the transformer and lowers repair costs. Plant expansion and extension can be made economically for a Jeffries Transformer provides the voltage change at the point desired without the need of long and expensive conduit runs. Besides a complete line of standard transformers, special designs and voltage furnished to order. Type S. S. Transformer 1 to 5 K. V. A. illustrated.

JEFFRIES TRANSFORMER COMPANY
5706 LONG BEACH AVE. LOS ANGELES

Crapo GALVANIZED PRODUCTS

Where strains and stresses are heaviest, where corrosion takes its greatest toll, *Crapo* Galvanized Steel Strand and Telephone Wire constantly are proving their outstanding superiority. The heavy, tenaciously bonded zinc coating, maximum tensile strength and correct ductility insure longer life and lower maintenance cost. Insist upon *Crapo* Galvanized Products for better performance under all conditions! Ask your Jobber or write direct!

INDIANA STEEL & WIRE CO.
MUNCIE, ♦ INDIANA

Crapo Galvanized Strand and Telephone Wire can be obtained readily in all standard grades and sizes.

The New BENJAMIN STREAM-LITER *is creating even greater enthusiasm for Fluorescent Lighting*

Orders now pouring in from all over the nation give proof that the new Benjamin Stream-Liter is the answer to the demand of industry and commerce for a fluorescent unit for general illumination and localized lighting in both plant and office.

Here is a new type of lighting unit using the latest developments in Fluorescent lamps and auxiliary equipment. It provides, economically and efficiently, a new type of lighting utilizing the color quality and high lumen output advantages of the Mazda Fluorescent DAYLIGHT or WHITE lamps.

It provides restful, comfortable lighting. It greatly improves seeing conditions; increases visual efficiency and reduces eye strain. It is especially adapted to the lighting of industrial establishments, offices, work shops and other industrial and utilitarian applications. Ask your Benjamin distributor for a demonstration of this new lighting fixture and for complete information about this Benjamin Stream-Liter and the other new Benjamin Fluorescent Lighting Units. Benjamin Electric Mfg. Co., Des Plaines, Illinois.

1. Conforms to the new RLM specification and has RLM Label.
2. Highly efficient and durable porcelain enameled reflector, 78% reflection factor.
3. Lamp adequately shielded from direct view by reflector with cut-off of 72½ degrees.
4. Total light output efficiency of unit 78%.
5. Additional shielding and increase in light output efficiency by closed ends.
6. Well diffused quality of illumination with soft luminous shadows and uniform distribution of light.
7. New type two-lamp auxiliary—power factor 95 to 99%.
8. Flicker reduced to minimum.
9. Equipped with starter switch of renewable type located in new type socket and easily accessible.
10. Easy to install—special hinged hook arrangement simplifies wiring and inspection.
11. Easy to clean and maintain.
12. Has Underwriters' Label of Approval.

BENJAMIN

LIGHTING EQUIPMENT

Distributed Exclusively Through Electrical Wholesalers

Benjamin Elec. Mfg. Co.,
Des Plaines, Illinois.

Please send me Catalog Page and Specifications on the new Benjamin RLM Stream-Liter.

Name.....

Title.....

Company.....

Address.....

City.....State.....

ELECTRA'S HUSBAND

Poem Sweet Poem

I ARRIVED home early, considering that it was the first work day of the new year. I dropped the *Call-Bulletin* on a chair, hung up my coat and headed for the kitchen where an odor of lamb curry and rice suggested the end of the holiday season and a return to our favorite dishes.

"Hello, honey," I said—always cheerful with good food in the offing. "What have you been doing today?"

"I've had a lot of fun," she replied. "And listen, dear, I've written a poem!"

"What is it," I asked, "an Ode to the New Year—or maybe Owed to The Emporium?"

"It's a New Year's poem," she said. "I call it November's Opportunity."

"Looks like you're rushing the calendar. But I'm intrigued. Read it to me."

This is Electra's poem:

NOVEMBER'S OPPORTUNITY

A new year before us
Recalls the old chorus,
"What will the harvest be?"
Will the social planners
And horoscope scanners
And bureau givers
To abundant livers
And court reformers
And pink barnstormers
Remain in ascendancy?

Or—
Will the great keynoters
Approach the voters
With horse sense notions
And fewer emotions
And talk real turkey
In an air that is murky
With Stalin's philosophy?

Oh—
Restore to our nation
It's historic station
Where private endeavor
May furnish forever
The needs of humanity
Without the inanity
Of Ickes and Carmody!

"Bravo, my dear!" I said "Even though your poem—and it's a honey—is not widely read, I'm sure its sentiments will find lodgment in many a weary heart. Both of the gentlemen you mention have attained a status of *nux vomica* among our more soberly minded citizens. What else have you been doing today?"

"Well, in my odd moments I've been looking at the new styles in the magazines and they just go to show that I've been right all along!"

"I know you're always right," I replied, "but I did not realize that you had any influence on the Parisian couturier. Is this a case of clandestine correspondence or just a demonstration of mental telepathy?"

"Don't be silly," she said. "Look at this picture of a sweater—how it buttons like a coat. There's some sense to that. Did you ever see me trying to pull one of those tight, buttonless, fuzzy things over my head right after I'd spent $1.50 for a re-do? And here's something else—nightgowns are coming back into style. Pajamas were invented for lazy Britishers living in India, but they have no place in a modern woman's wardrobe."

"Very interesting," I said, "but what is the main idea?"

"Well, I've been thinking that the master minds of the electrical industry might some day come to the realization that there are women in this free land—thousands of them—who prefer a high-oven range. They don't like the current stoop-over style for the same reason that I don't like a pull-over sweater. Neither of them suits my figure and wrestling with them induces anatomical strains common to many women as they emerge from the thirties. An hundred thousand years of evolution have taught men and women to stand and walk and work in an upright position and now the dumbbells who design stoves are trying to make us bend over like our simian ancestors."

"Your idea has merit and it has been considered by the industry. They even made a survey which clearly showed that the great majority of women prefer the flat-top, streamlined range."

Electra gave me one of her whimsical smiles and then said, "I recall a survey which clearly showed that Landon would be elected."

"All right—all right," I retaliated. "We might interview all the women who have bought the current model electric range and ask why they purchased."

Electra sputtered, "Why not interview all the women who did not buy and ask them what's keeping them out of the market? I'm going to keep my old range with its high oven and high back shelf where you can put things. I predict that the time will come when convenience will again be a factor in good style. And about the same time they'll put running boards back on our automobiles. Have you ever noticed a perfect 38 getting out of one of these stepless beauties?"

The time had come for a confession. "Yes, my dear, I have made a few casual observations and I know a lot of other fellows who are doing a little looking. Want to go to a movie tonight?"

Before she could answer me, I cast a silent word or two into the argument. I already felt a twinge of defeat.

"Changing the subject, eh?" she remarked. "We might as well go out—you haven't fixed the socket on my reading lamp. It's been out of commission since before Christmas. The condition of our electrical 'conveniences' reminds me of the shoemaker's children. My iron needs a new cord, the door bell's stuck, the lamp in the hall closet's burned out and the radio has the hiccoughs again. Some rainy Saturday afternoon when you can't play golf maybe you can fix them—or get them fixed might be better. I still remember the time when you took our automatic toaster apart. After you'd bought the new one I gave the old one to the Salvation Army and all of the pieces that were left over I donated to Jim's kid for his workshop."

When Electra gets in this mood a change of scene is advisable. "Come on," I said. " Let's go to a show. But before we leave, will you sew that button on my coat—it's two weeks since I asked you the last time."

"O. K. Let's stay home," she said. "I'll sew on your button and you fix my lamp and we can spend a happy and pleasant evening at home discussing the alertness and vision of the great electrical industry and all of those who compose it—of whom you are not the least. What would women do without men to provoke them?"

Hunting for a screwdriver, I answered, "And what would men do without women to nag them?"

[We have since been advised that the reading lamp, the iron cord, the door bell and the radio have been fixed but the lamp in the hall closet is still out.—ED.]

These New Models

add Further Opportunity for the Sale of Teletalk... and greater Opportunity for the Sale of Materials and Installation Labor

WEBSTER ELECTRIC **Teletalk** REG. U.S. PAT. OFFICE

Amplified Intercommunication

MODEL 524 has an inbuilt microphone. No manual operation of a "Talk-Listen" switch is required. Simply select station and talk. Available in twelve stations, with and without annunciator feature and twenty-four stations without.

MODEL 206. This is a new model of six station capacity and is available with and without the annunciator feature. The ideal unit for the small business.

MODEL 10112. This is a high power system especially designed for voice paging in factories or wherever the noise level is high. Twelve and twenty-four station capacities with facilities for group paging.

MODEL 1006 is designed for voice paging in offices. It is available in six and twelve station capacities. Each is equipped with an "all call" feature which permits calling all stations at one time.

THE opportunities for contractors to make money through the sale and installation of Teletalk are increased by the addition of these new models.

They provide a broader scope of intercommunication service. In addition, voice paging systems for both offices and industrial plants are now a part of the Teletalk line. You can sell them both systems.

This enlargement of the line provides you with two new and additional approaches to your institution, commercial and industrial customers.

When you are selling or installing switches, lighting or power circuits or any other product ordinarily purchased through you, is the ideal time to suggest an amplified intercommunication or paging system.

The profit on the sale is better than ordinary. Many installations require as much as 12,000 feet or more of wire in addition to conduit and junction boxes. Figure out for yourself what your bill for labor would be on installations of this kind.

There is a good three-way profit for any contractor —in the sale of Teletalk and in the sale of material —which run into good volume—and labor.

Write us for details and literature which describes the entire line. A new catalog is now ready.

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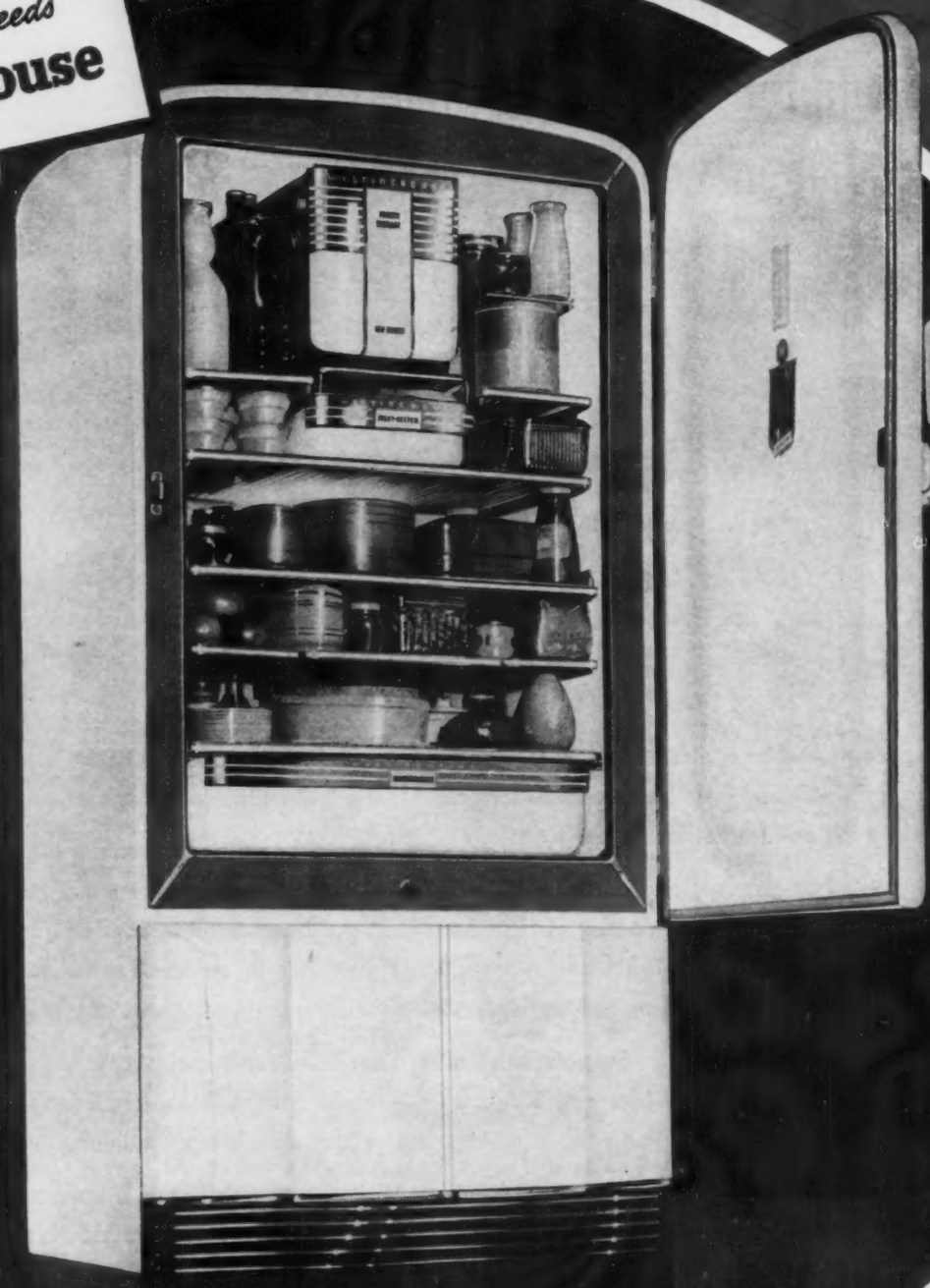
Webster Electric

"Where Quality is a Responsibility and Fair Dealing an Obligation"

FASTER FOR '40

Every house needs
Westinghouse



Westinghouse

"The Line of Least Resistance"

! NEW!

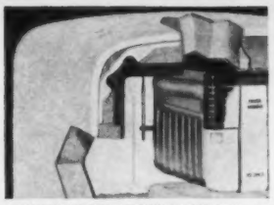
1940 PACEMAKER with Exclusive

TRU-ZONE COLD

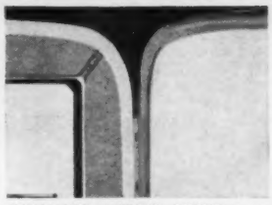
the SUREST, STEADIEST food protection temperature control in any home refrigerator

. . . plus striking new beauty in interior design . . . adds up to a new sales-winning combination for 1940

TRUE-TEMP CONTROL lets user dial exact temperature—holds it true no matter how hot the kitchen gets.



FIBERGLAS INSULATION is 10% more efficient than previous insulation—holds its efficiency for life.



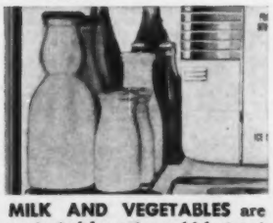
MICARTA DOOR LINER is 6 times more resistant than steel to heat penetration—combines lightness with rigid construction.

HUMIDITY FOR MEATS averages 85% in the big new sliding MEAT-KEEPER with crystal clear window-front.

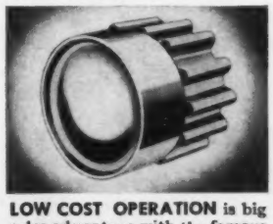
HUMIDITY FOR FRESH FRUITS AND VEGETABLES averages 90 to 95% in the big glass-top Humidrawer.

LEFTOVER DISHES of Peasantware are Hall Oven China. Set includes 2 leftover dishes, 1 butter dish, 1 water server.

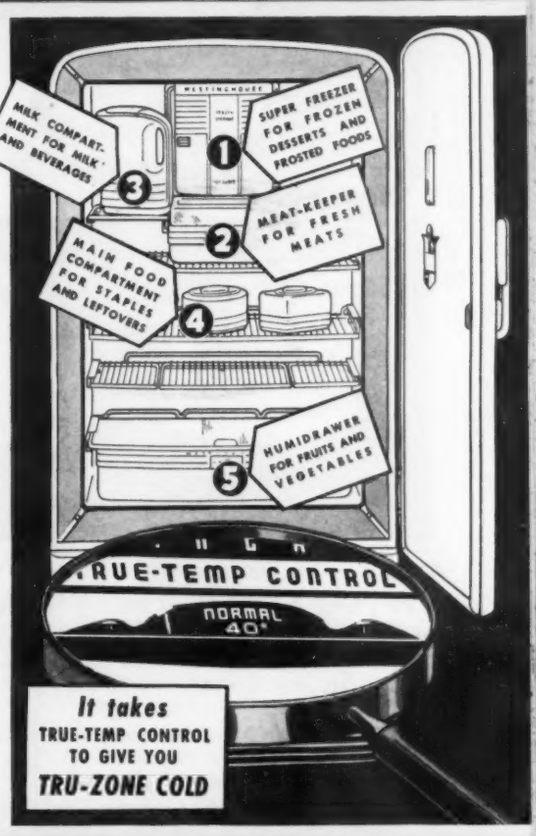
FROZEN FOODS in liberal quantities can be safely stored in the double-height top compartment of the Super Freezer.



MILK AND VEGETABLES are protected by extra cold but not freezing temperature in the large milk compartment.



LOW COST OPERATION is big sales advantage with the famous Economizer Sealed-in Mechanism, improved for 1940.



Refrigerators

FASTER FOR '40..

WESTINGHOUSE ELECTRIC

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

MANSFIELD, OHIO

This is going to be a great year for General Electric Ranges
SEE THE LINE AND YOU'LL SEE WHY!

EVEN FASTER HEATING UNITS AND LOWEST PRICES IN G-E HISTORY

THE CHANCELLOR
Model DD-40

THE SPEEDSTER Model DP-40 · THE MASTER Model CD-40 · THE LEADER Model CP-40 · THE PAGE Model CL-40 · THE STUDIO Model AP-40

Every One a New 1940 Selling Feature—Every One!

- New CLEAN SPEED 5-Heat Calrod Cooking Units throughout—each with new "Easy-Out" Aluminum Pan.
- New HI-SPEED 5-Heat Thrift Cooker. Gives surface cooking unit speeds!
- New Cooking Chart permanently fused on drip tray for handy reference.
- New Automatic Oven Lighting.
- New "What to Cook" Chart for Thrift Cooker, embossed on Cooker lid.
- New Bright Finish "Stay-Clean" Oven Shelves.
- New DeLuxe White and Chrome Hardware throughout.
- New Self-Indicating White Switch Buttons.

And Exclusive G-E • Tel-A-Cook Lights in Color • Triple-Oven—3 Ovens in One • Broiler Meter • **PLUS many more!**

A COMPLETE NEW LINE OF G-E ELECTRIC RANGES

Backed by Even Greater Advertising and Sales Support!

Heating speed stepped up . . . prices stepped down on the new General Electric Ranges! That's the BIG news for electric range dealers in 1940. And General Electric is out in front again with advanced G-E styling . . . finer quality, better looking ranges . . . self-demonstrating features . . . and *lowest prices in G-E history!*

To top it all a big new national advertising program . . . new, more colorful sales aids . . . and a sensational new point-of-sale demonstrator—"The Cooking Rebus"! Get the complete story NOW from your G-E Distributor. General Electric Comany, Appliance and Merchandise Dept. JR-0231, Bridgeport, Conn.

GENERAL ELECTRIC

What the Administrator Says About Bonneville

An Interview with Dr. Paul J. Raver, by George C. Tenney

BONNEVILLE began transmitting energy over its own facilities December 1. On that day, just a few hours after completion of the Bonneville project's first big transmission unit—a double-circuit, 220-kv. line from the powerhouse to a substation near Portland—26,000 of the plant's initial 86,400 kw. were being delivered to Portland General Electric Co.'s lines.

As of January 1, eleven contracts (Table I) aggregating 62,435 kw. of firm power, and variable amounts of surplus power, had been executed, of which one 15,000-kw. contract had expired. More contracts are in prospect; some are in process of negotiation.

Bonneville Power Administrator Paul J. Raver estimates revenues for the current fiscal year, ending June 30, will approximate $1,000,000. That means, he says, that Bonneville will have earned virtually up to its limit during the period between the energization of its lines on December 1, and the end of fiscal 1940.

When Administrator Raver came to Bonneville in September to take over the post left vacant by the death of J. D. Ross, he faced two tasks:

(1) Establishing a marketing and operating organization to supplement an organization largely designed for a construction program.

(2) Restoring confidence in representatives of legally constituted public agencies who deeply felt the loss of their leader, J. D. Ross.

When Raver took over his assignment he found the initial construction program nearing completion. It was necessary, therefore, to set up departments to deal with rates, research, marketing, and system operation. In the light of the new stage of development, changes in plans and personnel became necessary. These were made. As the program progresses, Raver said, the organization will be adapted further to the pattern best suited for marketing Bonneville power as new generating units come into production.

Under terms of the Bonneville Act, the administrator is required to give preference to public agencies in the sale of power. Twenty-five county-wide public utility districts had been voted in Washington on the basis of local option when Raver arrived on the scene. There were six such districts in Oregon. In addition, there were 39 operating, publicly-owned systems in the territory (Washington 27; Oregon 12). These groups have first call on Bonneville power. In fact, 50% of the plant's installed capacity is reserved for them until 1941; and they have preferential rights to the power after that date. The 50% reserva-ion does not, however, preclude sale of the energy set aside for public agencies to private groups on a dump basis.

Negotiations have been concluded with some of the districts and municipal power systems, and now are under way with others who are in a position to distribute power when it is available.

Indicative of the progress made by Raver in effectuating the public will for distribution of Bonneville power through such districts is the action taken by the commissioners of six public utility districts (PUDs) in the Goldendale-Hood River territory along the Columbia River. At a recent meeting called for the purpose of discussing power contracts, these commissioners passed resolutions requesting the administrator to serve as negotiator for them in the cooperative purchase of the facilities of the Pacific Power & Light Co., now serving the territory included in the districts. He accepted this invitation with what he said was a keen appreciation of the responsibility it entailed in seeing that both the group of districts and the utility received a fair deal.

From a practical standpoint, negotiation was the most desirable course in such a situation, Raver said, adding that duplication of the facilities was economically undesirable and that condem-

nations should be looked to only as a last resort.

Raver took the position that unless the facilities of a private utility were taken over as integrated units, a hardship would be worked both on the districts and the companies. The private utility would doubtless claim severance damages in the event of partial acquisition of its system. If these severance-damage claims were upheld by the courts, such as increment to the district's indebtedness would increase fixed charges and preclude the lowest possible rates.

Raver said that in the case of the six districts it might become necessary for the Bonneville Administration, as its part in a negotiated purchase of the private company's system, to acquire certain transmission facilities and incorporate them into the Bonneville system. Engineers are studying the situation.

Asked if the Pacific Northwest should have a federal agency comparable to the TVA, Raver replied:

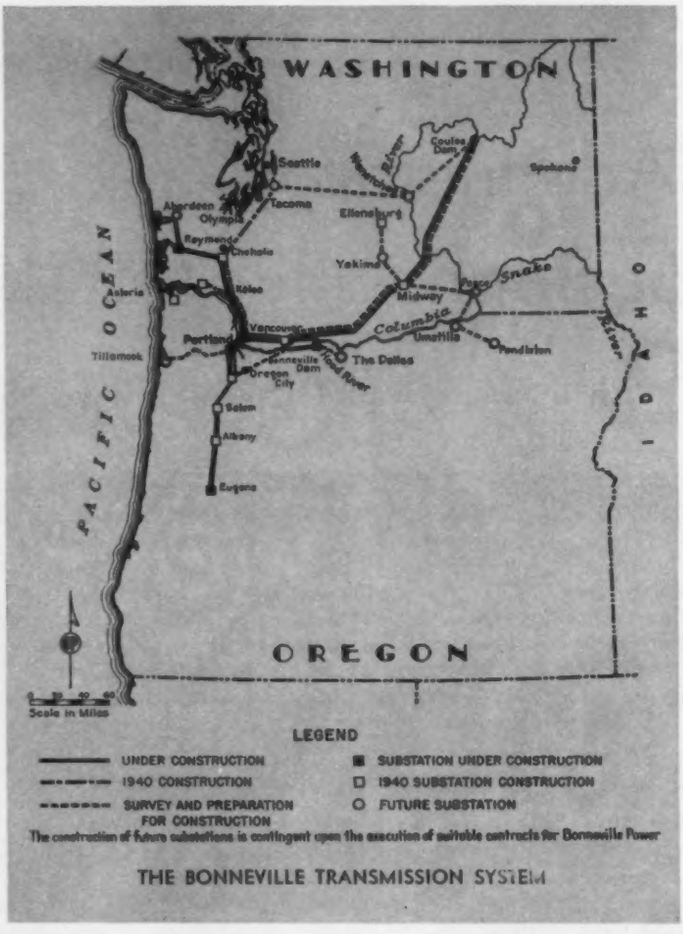
"There are many regional problems in the Pacific Northwest which could best be handled by a regional agency. Whether such an agency should follow the lines of the TVA is a question on which I am not prepared to express an opinion at this time." He added that since Bonneville's ultimate capacity of 500,000 kw. is only a small portion of the potential 11.5 million kw. of Columbia River power, he would be guided in the matter by the wishes of the people themselves as expressed in Congress.

In recent weeks some criticism was directed at the Bonneville administration to the effect that its staff had been actively campaigning in a public utility district election in Lane County, Ore. Raver denied these charges, stating publicly that his organization had engaged in no improper activities.

"Where members of our staff have appeared, they have done so by invitation," Raver said. "My staff and I will continue to accept invitations to appear publicly to discuss Bonneville and its effect upon the economy and development of the Pacific Northwest. Our literature presents only facts. If such literature is construed as pro-public ownership, it's a matter of point of view."

The basic transmission system of the Bonneville power project is rapidly nearing completion. The line into Portland is in service and is delivering power. Other lines and substations are scheduled for early completion. (See Table II). Most of these will be in service between July 1 and October 1. Some 27 million dollars has been appropriated for these facilities, and the budget for the next fiscal year contemplates some additional appropriations for extensions and inter-connections.

Raver said several million dollars would be saved over original transmission system cost estimates by the contemplated program of interconnection.



THE BONNEVILLE TRANSMISSION SYSTEM

Obviously it would be uneconomical and wasteful to duplicate or parallel any of the existing transmission facilities which might be utilized in taking Bonneville power to its natural markets. The Bonneville engineers, therefore, are studying just where and how interconnections should be made.

The Bonneville Power administrator has a very clear-cut policy with respect to interconnection and integration. Under the proposed method, which is being worked out with the large publicly-owned plants of the region, both parties to an interconnection would maintain complete independence but agree to schedule their operations so that each might, without disadvantage to the other, obtain maximum economic benefit from interconnection. Among the benefits listed by Raver were:

(1) Reduction of reserve capacity, as either system may call on the other in time of emergency.

(2) Displacement of steam energy by surplus hydro energy, preventing waste of water power.

(3) Exchange of surplus hydro energy where a diversity between hydraulic conditions produces a mutual firming up.

(4) Reduction in total generating capacity by taking advantage of any diversity that exists between system peak load.

(5) Programming of generator installations to reduce the over-building factor on the combined load.

These advantages could be obtained by coordination on a mutually agreeable and cooperative basis, under which the two systems would, in accordance with a contractual understanding, work out the means of obtaining the natural economic benefit resulting from interconnection, Raver said. From time to time, the weight of economic advantage might swing from one system to another, but in the long run both systems would save money and increase the reliability of their service, he added, saying that this was the type of integration which the Bonneville system had proposed to the four major municipal systems in Washington and Oregon. The same principles would apply to any private utility which contracted for Bonneville power.

Additional generating capacity at Bonneville dam is being installed at the present time by the Army Engineers. Units 3 and 4 are expected to be ready for service early in 1941. Orders already have been placed for Units 5 and 6.

Raver is particularly proud of his engineers for their achievement in completing the Bonneville line down the Columbia Gorge in time to tie in with the Portland General Electric system within a few hours after he had signed the short-term contract for delivery of 10,000 kw. of firm power to the company. The contract was signed at 6:30

p.m. By 10:30 p.m. the systems were interconnected through one circuit and were functioning perfectly.

There has been considerable discussion of the Portland General Electric contract. It is an interim agreement, and the amount of firm power is limited, although the company may purchase quantities of dump power if it so desires. Some have pointed out that the short-term contract was a deliberate attempt to keep the Bonneville power project administration in a neutral position until after a public utility district election in Portland next May. Raver pointed out, however, in a letter to Oregon Utility Commissioner Ormond R. Bean, who had invited him to sit in on rate reduction hearings for the Portland General Electric Co. that the question of appropriate resale rates was one of the principal problems involved in the negotiations with Pepco, and that because an agreement on this question could not readily be reached with the company, and because of the urgent need of the people of the Portland area for Bonneville power, he had agreed to enter into a short-term contract with the company, pending further discussion of a longer-term agreement.

Raver sees in the Bonneville power project a great opportunity to lay the foundation for new industrial development in the Pacific Northwest, as well as provide adequate power at a low cost for domestic and rural consumers. A contract has been completed with the Aluminum Company of America for an initial block of more than 30,000 kw. of firm power, deliveries to begin by January 1, 1941. It is understood that the ultimate requirements of this one organization will approximate many times the initial demand. It is also reported that negotiations are proceeding with another important industry for a block of some 30,000 kw. Other prospects are under consideration.

As another phase of its industrial activity Bonneville has assumed active leadership in a Pacific Northwest industrial-economic survey with the view of utilizing Bonneville power in the development of the natural resources of the area.

"Bonneville enthusiastically shares the growing interest of leading Northwest groups and citizens in the possibility of attracting new payrolls to the region through the medium of low-cost power," Raver said. "The contemplated survey will be no academic affair. It is to be thorough and its results will be applied. By utilizing the ability and experience of the Pacific Northwest Regional Planning Commission, the Northwest Regional Council and the Bonneville Project Administration, we can assemble detailed knowledge of the physical and human resources available. Bonneville has assembled a staff of highly-trained, competent and experienced technicians for studying power in its relationship to industry and surveying raw materials which might be developed through the use of power."

As was indicated by Raver's statement to Commissioner Bean, resale rates have been troublesome. The administrator is at the present time working out a resale rate policy which he intends to announce soon.

Inferentially the Bonneville Act requires that the benefit of Bonneville power should be passed right on through whatever distributing agency buys it into the hands of the ultimate consumer. Hence it is necessary that the Bonneville Power Administration develop a policy with respect to resale rates that will assure the public of the savings it deserves.

Resale rates have been written into one contract executed so far by the Bonneville power administration. This was the contract with Forest Grove, Ore., a small community about 25 miles west of Portland which operated a municipal diesel generating electric plant. Bonneville cooperated with the city in working out the rates. (ELECTRICAL WEST, Dec. 1939, p. 56).

In summing up his views on the relationship of Bonneville to the Pacific Northwest, Raver said he felt that such projects as that which he represented and the one now under construction at Grand Coulee farther up the Columbia would supply the key to the development of the area by attracting new industries, creating new payrolls, providing new markets, and supplying power to urban and rural areas in sufficient quantities and at low enough rates to improve generally the standard of living of hundreds of thousands of people. The Bonneville staff, he declared, would be dedicated to the achievement of these aims thereby aiding development of the area.

Table I—Contractors for Bonneville Power, Jan. 1, 1940

Contracting Agency	Date of Contract	Amount (Kw.) Firm	Amount (Kw.) Surplus	Delivery Date
Now Purchasing:				
Northwestern Electric	7-26-38	15,000	15,000	8-18-38
City of Cascade Locks	2-14-39	75-225	225	7- -38
Columbia Construction (temporary)	10-23-39	60	...	10-23-39
City of Forest Grove, Ore.	11- 7-39	750	...	11-28-39
Portland General Electric	12- 1-39	10,000	Variable	12- 1-39
	6- 1-40		by Agreement	6- 1-40
City of Canby, Ore.	12-23-39	300	...	Intermediate
Not Ready to Purchase:				
Skamania County, Wash. PUD	8- 2-39	200	...	6-15-40
Pacific County, Wash., PUD	10- 5-39	1,500	...	6-15-40
Wahkiakum County, Wash., PUD	11-10-39	400	...	...
Klickitat County, Wash., PUD	12- 5-39	1,500	...	1-1-41
Aluminum Co. of America	12-23-39	32,500	...	Indefinite

* Contract expired Dec. 31, 1939.

Table II—Status of Bonneville Transmission, Dec. 1, 1939

Line	Miles	Kv.	Percent Complete
Bonneville-Vancouver	37.4	230	100
Bonneville-Oregon City	55	115	Profile on surveys, 77.9
Midway-Yakima	32	115	Profile on surveys, 31.8
Yakima-Ellensburg	32	115	Profile on surveys, 95.3
Chehalis-Renton	..	..	Final design of towers, 20.8
Renton-Coulee	190	230	Profile of surveys, 34.5
Vancouver-Kelso No. 2	41.2	230	Surveys, 100
Bonneville-Coulee No. 1	233.7	230	29
Bonneville-Coulee No. 2	233.7	230	In design and survey stage
Bonneville-Hood River	22.7	115	Surveys and design 100; construction specifications 95; materials nearly 100 delivered
Hood River-The Dalles	16	115	Same as Bonneville-Hood River. Design approximately 90; land purchased, specifications, 90; clearing and grading 70
Vancouver-Kelso No. 1	41.2	230	Surveys 100; design 100; right of way 100; materials nearly all delivered or manufactured. Line available for work 68
Kelso-Chehalis	30.1	230	Line available for work 100; no construction yet
Chehalis-Raymond	45.5	115	Available for work 41; materials nearly 100 delivered or manufacture completed
Vancouver-Eugene	127.6	115	95.7
St. Johns-Tillamook	62	115	Surveys approximately 8
St. Johns-Astoria	87	69	Surveys approximately 10
Bonneville-Cascade Locks	6	13.8	100

Denver Jubilee Builds New Sales Peaks in Rocky Mountains

Annual electrical show by Rocky Mountain Electrical League enables dealers to report heavy pre-Christmas sales gains

CALIFORNIA climate is standard equipment on the Pacific seaboard at Yuletide, but snow, cold weather or some other stimulating urge has always been required in the Rocky Mountain region to remind the buying public that Christmas was nigh.

Santa Claus, perspiring freely, played a "No Sale" dirge on merchants' cash registers during latter November, despite the early Thanksgiving. Then the Rocky Mountain Electrical League—providing the stimulus where weather failed—sparked a tremendous buying spree with its annual Electrical Jubilee.

On Nov. 30, scores of electrical expositions opened throughout RMEL territory, featuring streamlined electrical appliances and equally streamlined glamour girls. They left in their wake an aroused Christmas spirit and depleted stocks on erstwhile despondent merchants' shelves.

Approximately 100,000 potential customers attended Jubilee celebrations in Colorado, Wyoming and New Mexico, with utilities operating in parts of Utah, Montana, South Dakota also taking part. In Denver alone, 21,150 visitors crowded through the Shirley-Savoy hotel auditorium doors Nov. 30, Dec. 1 and 2. At Casper, Wyoming, the door count was 5,073. All communities that availed themselves of the publicity and promotional ballyhoo emanating from the League's Denver headquarters reported immediate and sustained gains. One electrical dealer hunted up officials to report: "The day the Jubilee started I made 102 sales—more than the total of the previous three weeks."

The Denver exposition, serving the largest concentrated population, was the most elaborate. Electric cookery got a big play, with The Denver *Post's* mince pie baking contest occupying a special arena in the middle of the auditorium floor. Electric roasters were used exclusively; and all competitors rejoiced in the opportunity to tell spectators the sterling merits of these versatile cooking devices. Long before awards in this event were made to prize winners, a remarkable upswing in the sale of electric roasters was noted.

Six stage shows daily featured pretty girls dressed in cellophane bridal costumes. They presented a "Style Parade" between giant polaroid panels, each girl bearing a transparently wrapped electrical appliance suitable for Christmas giving. Color effects produced by polaroid on the cellophane gowns were spectacular, drawing capacity houses at each performance.

Electric shavers came into their own at the Denver show. A factory representative was on duty afternoon and evening mapping beard contours—with the aid of a polariscope—for male visitors, and applying the electric shaver to faces previously serviced by soap lather or shaving cream. This demonstration feature was reflected in a field day for dealers, who reported that women were the principal purchasers of electric shavers as gifts for their men-folks.

Another highlight of the exposition further emphasized electric cooking: an act billed as "The World's Tiniest Hostess," disclosed a young woman four inches tall going about culinary duties in an all-electric kitchen enclosed within a goldfish bowl—an optical illusion achieved with a reducing glass. This unique attraction, visible to only three or four persons simultaneously, proved to be a major sales promotion, favorably affecting even the larger appliances such as electric cooking ranges and refrigerators.

Fluorescent lighting was dramatized by a stage show in which patterns on the skin surfaces of a young woman were revealed under "Black Light" after ordinary illumination failed to discover them; and by a "Skeleton Dance," made possible by phosphorescent paint on the costume of a male dancer.

Christmas lighting activities on a broader scale than any previously attempted, started immediately after Jubilee celebrations closed. Commercial interests, in and out of the electrical industry, agreeing that seasonal illumination is the greatest spur to business, joined with the League in a program that embraced hundreds of communities. Denver's Mayor Stapleton gave support to a plan whereby all cities and towns in the Rocky Mountain area tuned in on a cooperating radio station at 6 p.m. December 20. At a signal given by the Mayor and broadcast to all receiving sets, residential and municipal lights flashed on simultaneously in all of Colorado, Wyoming and New Mexico, and in the portions of Montana, South Dakota, Utah and Nebraska where RMEL member-firms operate. Junior Chambers of Commerce sponsored and actively promoted this ambitious program, working with municipal officials and newspapers.

Below is one corner of the auditorium in which the Denver Electrical Jubilee was held. For the first time in Rocky Mountain territory, fluorescent lighting was aggressively promoted. Note the overhead units. Thirty-two booths occupied floor space at the show. Demand for space was much greater than could be accommodated. Such is the proven business-building quality of this pre-Christmas shopping stimulator in this area

Handbook

PG and E issues special booklet for appliance salesmen

SMALL enough to go in a salesman's pocket yet containing a wealth of useable information, the Appliance Salesman's Handbook just produced by Pacific Gas and Electric Co. for appliance salesmen of dealers throughout the system is something of an achievement. Certainly it represents a great deal of research and planning as well as containing many original kinds of data.

It began over a year ago as an answer to requests of many appliance dealer salesmen as to figures on the cost of operation of ordinary home electric appliances. The issuance of such a booklet was made the study of a special general office sales committee. To make it fit any particular salesman's operations, it was necessary to plot the costs of operation based on all the particular rates applicable in the field in which the salesman was active. The company had experimented with slide rules and cost wheels in previous promotion pieces distributed to dealer salesmen, but these were not considered complete enough.

The present salesman's handbook embraces "rate schedules, operating costs, and customer benefits," applicable to lighting, radio; electric kitchen appliances such as range, water heater, refrigerator, roaster; to home laundry appliances including washing machines, and ironer; and to electric space heaters. For gas salesmen, a section can be inserted covering gas rates, gas kitchen appliances and gas heating appliances.

Made up in looseleaf form, each booklet is tailor-made to fit the requirements of the dealer salesman to whom it is personally given. If that salesman sells only lighting, he gets only the the lighting sheets. If he sells only electric kitchen appliances, he gets only those sheets.

Divisions were asked to send in their requirements specifically for the number of dealer salesmen in their own territories. Each division then assembled its own books and made its own personal presentation of them to the dealer salesmen. Dealers, however, clamoured for more of them and a second print order has been put in with the printer. Wholesalers hearing of this booklet, have asked for copies too.

Further distribution of the booklets will be made to the sales force of the PG and E and to its complaint and service departments.

Character of the material is interesting. The booklet begins with a page

This quick reference handbook for PG and E appliance salesmen should close many a sale

graphically showing the distribution of the average family budget in percentages spent for food, clothing, furnishings, etc. and electricity. Electricity calls for 1.7% of the family budget. On the back is shown graphically how much food a dollar bought in 1914, 1929 and today in comparison to how much electricity can be bought for a dollar.

The domestic rate schedules in a territory in which that dealer operates in follows. The front page gives a short statement of what the domestic rate is. On the back of the sheet is a table showing exactly the cost of kilowatt hours in sets of two from zero to 498. In these costs, the service or meter charge is computed in the table.

Under the appliance tabs are then placed the sheets applicable for the specific rate schedules. For instance, under lighting, a table of the "cost of additional lighting based on 60 hours average use monthly" is broken down for the rate schedule applicable. It shows the wattage to be added, the cost in cents if the present monthly bill is $1.66 or less, $1.67 to $5.29, or over $5.29 per month, for example. On another or a rural rate schedule, these same costs are computed on other minimums.

The backs of such pages show a list of benefits to be derived from proper lighting in the home. There is also a page describing the features of I.E.S. floor lamps, on the back of which is more good sales data relative to lighting.

Thus the salesman has at his fingertips, in answer to inquiries as to operating costs from customers not only the actual rates applicable in the territory, but handy tables which permit him immediately to compute what the additional electricity employed by the appliance in question will cost if the customer's bill is now within such and such a range. He also has a reminder sheet to freshen his memory as to the benefits he can sell, that more than justify the additional cost of the electrical appliance.

Matchless Home

Los Angeles model house ideal spot to entertain prospects

Many a salesman has wished for a sort of retreat to which he could take his prospect uninterrupted and close the sale. Such a center the Matchless Electric Home in Los Angeles is rapidly becoming for the appliance dealer salesmen throughout southern California. And for the first time in history, all five of the utilities serving the area, both municipal and private, as well as the Electrical Development League, are using one piece of literature to promote this all-electric home.

Concentrated at the Matchless Electric Home are the house itself, complete in every electrical detail, a large two-car garage at the end of which is a model kitchen, a hobby shop, a separate building on the ground floor which serves as the display room and the upper floor as a branch office sales room.

Cooking classes for small groups of prospects are held every morning in the garage. The average group consists of about 27 women, attended by three or more dealer salesmen. The hobby shop contains tools and equipment of interest to the man. In the display room, one model of each manufacturer's range is on display.

Thus salesmen can invite the man and his wife to come out to the electric home when he makes his call. Thus he gets them away from the distractions of their own home surroundings, brings them to an atmosphere in which the electrical idea is to be seen on every hand, has features and appliances to interest both the man and the woman, has at his disposal a display of merchandise and thus has an ideal set-up for selling.

During a day, three hundred people go through the home. A rotogravure booklet with a first printing for 135,000 copies is distributed by the five utilities and the League being given personally to good prospects. Each of the utilities has a space in which to spread its own particular message as to rates applicable in its territory, its kitchen planning service, etc.

Certainly the Electrical Development League of Southern California has not missed one detail in the promotion of this handsome place.

Altogether, the sales combination presented to the industry through the Matchless Electric Home is one that most salesmen in southern California are using very effectively to build more business.

One Dish in a Washer Is Worth Two in a Sink

By Irene S. Gray

THE Chinese probably have fewer automobiles per capita than any other nation, and, of course, you are already asking what this has to do with electric dishwashers. Well, would automotive manufacturers ask the Chinese for their opinion of our modern means of transportation in order to give weight to sales efforts? Certainly not; yet, that is the approach being used to the electric dishwasher.

Apparently it is going to be necessary for the housewife to do a selling job for the biggest labor and time saving appliance that has ever been made available for the small home. So let's really analyze the problem of placing this drudgery-eliminator in service.

It will probably be safe to assume that there are twelve work hours possible in a housewife's day. No forty-two hour week here. Dishes have to be washed after each meal. A good average to assume is twenty minutes in the morning; fifteen minutes for lunch and twenty-five minutes for dinner, and many of us still bake, so here's another twenty minutes for washing baking dishes, or a total of one hour and twenty minutes, or 11% of total working hours. A more impressive figure would be the yearly hours spent in washing dishes; 486 hours, or, over 40 twelve-hour work days spent at the kitchen sink. Compare this with the 15 minutes daily required with an electric dishwasher.

Some skeptics will doubt these facts, but after using an electric dishwasher for more than two years, I can assure you that I have been more than considerate of the old dish pan. In our home, dishes are washed twice a day, and there are never any dirty dishes in the sink. They are taken directly from the table, scraped, and placed in the dishwasher, as soon as breakfast is over; then they are followed by any baking dishes, and later by lunch dishes.

In the meantime, the cover of the dishwasher is closed and there is no mess or fuss. After lunch, the complete washing takes place, and the dishes are removed to shelves. This is accomplished in about five minutes. Dishes that may accumulate in the afternoon and in the preparation of dinner are a repetition of those from the previous meals. There are more in this washing, so let's charge up ten minutes for good measure and I am over an hour to the good compared with using my discarded time-chiseler, the dishpan.

So much for the time element. Now what about this bugaboo of cleaning dishes before putting them in the electric dishwasher. It is just pure bunk. Anyone knows you have always had to scrape particles of food from plates and similar dishes. No one would think of placing dishes from the table directly in a dishpan without this preliminary cleaning. The electric dishwasher is no different.

Now come the pots and pans, the ghost that always appears when an electric dishwasher is mentioned. This is just another case of the pot calling the kettle black. If they do not have gravy or similar foods adhering to them they go right in with the other dishes. Pots and pans with food stuck to them never could be washed without scouring separately, so we can't condemn the electric dishwasher at this point. It's at least on a par with the dishpan, but there are so many things in favor of the electric dishwasher that it should not even be necessary to have to dispose of the petty prejudices against them.

Let's list some of the advantages before we go any further.

1. Washed in water that is really hot; therefore, more sanitary. 2. No dishes in the sink waiting to be washed, which always gives an untidy appearance to the kitchen. 3. Not necessary to dry anything except the silverware. 4. Over an hour of time per day saved. 5. Fewer broken dishes. 6. Good-bye rubber gloves and chapped hands from frequent submersion in grimy water.

Of course the children have to have something to do. We all have memories of our own childhood and wouldn't want them to miss any of these events so indelibly written on the pages of our early years. We used to have a wood box to be filled, water to carry and a dozen other chores, so why be so short-sighted. Times are changing. The dishpan is on the way out. Let's hasten its departure. If the electrical industry can't do it, why not ask the housewives using electric dishwashers what they think of them.

I forgot to say we are a family of three and I still insist our electric dishwasher is a good investment. Along with it we have an electric range, refrigerator, washing-machine, ironer, vacuum cleaner, water heater, mixer, toaster, waffle iron, coffeemaker, egg cooker, five clocks, electric tea-kettle, three radios, and our power bill is ten to twelve dollars per month. Those are a lot of servants for 35c a day.

Of course, 35c would hire a maid for 40 minutes per day, but I will still take my electric helpers, especially "Dinah," the electric dishwasher, the hardest worker of them all.

ELECTRICAL WEST SALES GUIDE

---AND NO PLACE TO GO

You keep your store all dressed up with appliances, ready to be sold and used. Suppose they have no place to go? Suppose there aren't outlets enough to plug them in? How many sales do you lose because customers couldn't use your appliances even if given to them? How many of your service complaints are really caused by poor voltage that makes the appliance lazy, sleepy, slow on the pick-up, wasteful—plain unsatisfactory?

Not your fault, to be sure. Somebody, when the house was built, did not put in fat enough wire, enough outlets, enough spare sap or capacity. But **you** have to twiddle your thumbs instead of selling your appliances because of it. Can't something be done?

Don't just cuss wiring. To you it may seem to be nothing but a nuisance and a sales resistance. **But it won't do your business any good to complain about it to a customer**—or agree with one who complains about wiring to you. Only makes her delay buying some electrical appliance from you that much longer.

Instead, **talk up** wiring. See the suggestions on the next three pages for ideas. If you can help sell the idea of rewiring you make places for your appliances to go—and that means future sales for you.

[Just an appliance cord in search of its outlet]

ADEQUATE WIRING

JANUARY 1940

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OH, BY THE WAY—

HAVE YOU THOUGHT A

Morning exercise?

Where to plug it? Will it go on the shelf and stay there?

Chances are your customer hasn't given wiring a thought, doesn't know anything about it, thinks she cares less. She'll wonder, "Why bring that up? What has wiring to do with my young life?"

Start your customers thinking about it and they won't put up with wiring that steals from them by wasteful, slow-poke operation of their electrical conveniences. They like to get their money's worth. They expect electrical appliances to be fast. They want them to operate cheaply.

So ask them questions like these. They simplify the whole wiring question into a few really important points.

Enough outlets?

"Do you have to disconnect one appliance or lamp in order to use another? Do you have to use a lot of these double or triple plugs to accommodate your lamps and appliances? Do you have occasion to stand on a chair to connect a vacuum cleaner to an overhead lamp socket? Accidents from falls under such conditions are often serious. Do you have to move furniture or reach into difficult places to get at an outlet? Do you have to run a lot of long cords in an attempt to get electricity to your lamps?"

Enough switches?

"Can you turn on lights ahead of you at each door as you enter any room or hall or must you grope in the dark to find a light switch?"

SUGGESTED BY

T ABOUT WIRING?

A switch at the doorway is worth two on the lamp

Big enough wire?

"Does it take a long time for such appliances as a toaster, percolator or roaster to reach the right temperature? Is you washer slow to start, and does it dim all the lights when you start it? Do the lights dim when the refrigerator goes on? Or the radio fade?"

Enough reserve?

"Do fuses blow out often? Could you bring home new appliances with a knowledge that you could use them? Are the wires leading to your house big enough so that you could use a range or water heater without much extra wiring? Are you sure your lamps burn as white and bright as they should?"

She only wants to plug in the mixer, that's all

Leave these questions with your customers to think about. The answer to them should be referred to a good electrical contractor. He knows the technical details, the codes, and he has the materials and the skilled men to install more wiring. Don't encourage anyone to try makeshift jobs with cords. That only chokes up an already strangled wiring system.

Now turn the page—

YOUR SALES ALLIES

PUGET SOUND POWER & LIGHT CO. • WASHINGTON WATER POWER CO. • PORTLAND GENERAL ELECTRIC CO. CALIFORNIA OREGON POWER CO. • UTAH POWER & LIGHT CO. • IDAHO POWER CO. • THE MONTANA POWER CO.

HERE'S AN IDEA

"MAKE IT SIMPLE
REPEAT IT OFTEN
MAKE IT HURT"

That, according to a prominent man in the wire industry, is the essence of publicity. And Adequate Wiring certainly needs all the talk, all the publicity you can give it. Otherwise you'll run into a "wire saturation" that will prohibit you from selling appliances far more effectively than a man-made law. Ohm's law, the one about volts and amperes, doesn't make any exceptions, tear up any of its tickets, though. It only lets so much electricity go through a certain sized wire without burning it up.

That's where inadequate wiring **hurts** you—and your customers.

But here's an idea you might try—

In the next column are a few very **simple** statements that **you** can and should **repeat often.** They put over the idea of how inadequate wiring **hurts.** They give hints as to what to do about it.

—Flash them in conversation, in sales talk.

—Use them in ads.

—Put them on window posters, showcards.

—Paste them on sales tags.

—Repeat them often.

Use the trade-mark, the cartoons, the booklets and leaflets of the National Adequate Wiring Bureau. The local utility probably has some if you'll ask for them. They too tell a simple story of service and savings and make it easier for you to tell it often.

Keep clearing the sales resistance away ahead of you and there will never be a saturation, a blockade of your opportunities.

Now they won't get balled up. "A" is for the table lamp, "B" is the radio, "C" is the refrigerator. But look out for "D". It's the vacuum cleaner. If you pull too hard on it the whole works will go dead*

Try these—

You pay for electricity at your meter. Why use so much of it pushing it through too small a wire before it ever gets to the appliance? Have more installed.

Watch that "thief in the wire" that takes its toll day in and day out on the electric bill.

Adequate wiring gives you a full dollar's worth of quick electricity when you want it.

Too small wire delays you twelve hours a year, or two minutes a morning getting your coffee.

Cheap wiring, like cheap teeth, are expensive. Remember that if a cheap price won't buy what you really need, you'll pay for it every day you are without the right thing.

You can't fill a bathtub very fast from a teakettle.

Your electric appliances won't get hot quick if they aren't fed properly, either.

Better resale possibilities, a more valuable property if your home is wired for more abundant electrical living, more convenience.

ADEQUATE WIRING SERVES AND SAVES *

YOU MIGHT TRY

Treasure Hunt

More than 2,000 people attend southern California sales stunt

A vigorous program of newspaper advertising unearthed "treasure" for the sponsors of the second annual Electrical Treasure Hunt at Fullerton, Calif., Dec. 1 and 2. More than 2,200 persons visited the stores of the nine participating electrical dealers during the two days, inspected the newest electrical appliances, shared in the distribution of merchandise prizes and left their names and address—good prospects for future sales.

According to its sponsors, the Treasure Hunt increased store traffic, built fine prospect lists, increased business, and brought an augmented realization on the part of the public of the new developments in electrical home appliances and the wide facilities which exist for their purchase in Fullerton.

John V. Payne, an owner of the McMahan Furniture Co., one of the sponsors, states that business during the weekend of the Treasure Hunt was up 27% over the previous weekend. Compared to the same dates in November, the increase was 94%, and compared to the same period in 1938, the increase was 61%.

Headquarters for the Treasure Hunt were established in a vacant building on the main street. A large exhibit of latest models of domestic electrical appliances, both large and small, was shown in decorated booths of sponsoring stores. A number of the appliances were used in cooking demonstrations. Headquarters were open from noon until 10 p.m. on the days of the hunt, and refreshments were served.

Persons searching for "hidden treasure" began their hunt at headquarters. There they received a long registration ticket with nine separate sections, each printed with the name and address of a sponsoring store, and a blank for the entrant's name and address. Each section of the ticket was filled out by the entrant and taken to the proper store where it was deposited in a box. Prize-winners were selected from the registration cards thus obtained.

One registration was permitted each person each day. The hunt was open to any adult resident of Fullerton and vicinity. Prizes were awarded at headquarters at various times during the two days. The prize list included two electric roasters, five coffeemakers, mixer, floor lamp, two boudoir lamps, automatic iron, automatic toaster, juicer, grill-cooker, waffle iron and electric toy train.

The attendance of 2,200 persons at this year's two day Treasure Hunt compares favorably with last year's figure of 1,700 at a three-day event. Sponsors of the hunt were Selfridge Electric Co., Fullerton Hardware Co., Famous Department Store, Hoppe's, McMahan Furniture Co., Sears Roebuck and Co., Gold Furniture Co., W. J. Schulz and the Southern California Edison Company. H. C. Rice, merchandise manager, plans to conduct similar cooperative activities in other of the company's districts.

Lucky winners in the Fullerton, Calif., treasure hunt show the results of their efforts. Business during the weekend of this clever contest zoomed to nearly 100% over a previous November

Faster for '40

New Westinghouse theme for merchandising division adopted

"Faster for '40,"—so goes the new theme of Westinghouse Electric's merchandising division. Adopted at the annual two-day convention held Dec. 4 and 5, the slogan will cover the company's 1940 line of household refrigerators, ranges, water heaters and other household appliances as shown at the convention.

Frank R. Kohnstamm, sales manager of the merchandising division, told distributors that he felt 1940 will be one of the biggest years in the history of the division. Advertising appropriations have been upped, and more aggressive sales training programs prepared.

Two of four winning distributors in the annual "Fight Fest," a Westinghouse refrigerator sales competition were E. W. Isenhower, Westinghouse Electric Supply Co., Los Angeles and Gene Kramer, Electric Supplies Distributing Co., San Diego.

Among the 35 distributors' representatives honored and awarded prizes for refrigerator sales performances in 1939, were Tom Savage, Intermountain Appliance Co., Denver, Colo.; Frank Waite, Westinghouse Electric Supply Co., Phoenix, Ariz., and C. E. Saviers, H. E. Saviers & Sons, Inc., Reno, Nevada.

● "READ 'EM AND REAP" was the clever title of a compact and complete Christmas advertising schedule issued by the Montana Power Co. Twelve ads, 2 col. x 6″ were inserted in booklet form, together with publication date of each ad and subjects. Dealers were invited to tie-in, and the ads were run in a recognized list of newspapers in Montana Power's territory.

● WIDESPREAD PUBLICITY for the electric range was given Frigidaire as a result of an advertising agency advertisement in November. Lord and Thomas, in a two-page spread in all business publications, illustrated how, by means of a questionnaire research, the Frigidaire electric range was designed in response to expressed consumer preferences. Reproduction of the graphic means of inviting customers to check preferences on questionnaire pages showed the thoroughness with which every feature of the range was investigated. This questionnaire method has been used by General Motors to feel out customer reaction on many of its products.

Western Mart

Furniture exchange in San Francisco states 1940 plans

National figures in the appliance industry will be the starred speakers of the 11th annual radio and appliance trade dinner, Wed., Feb. 7, during the spring market week of the Western Furniture Mart in San Francisco. George L'Amoreaux, manager of the appliance division of the Mart, said that George S. Jones, vice president and general manager, Servel Inc., of Evansville, Ind. would be one of three principal speakers. Two other speakers on appliance marketing topics will be on the program. In addition there will be an entertainment and the customary market week activities.

There are really six markets in one this year during market week in San Francisco: the 49th western furniture market; 14th floor covering opening; 11th western radio and appliance show; western housewares, lamp and giftwares show; curtain and drapery show; linens, domestics and bedding market. With western regional offices of such appliance manufacturers as Frigidaire, Westinghouse, Landers Frary & Clark, Easy, Norge, and Stromberg-Carlson in the Mart, and display rooms of wholesalers and distributors such as Graybar, G-E Supply, H. R. Basford, Leo J. Meyberg, Electric Kitchen Appliance, Thompson & Holmes, California Electric Supply, as well as those of northern California representatives of Thor, Magnavox, Majestic, Farnsworth, and many others, the Mart concentrates in one place a complete variety of lines from which buyers and dealers may select the latest models in merchandise.

Europe's war means less apples are going abroad these days. Pacific Power & Light decided to do its bit in the apple industry campaign now under way. Company customers received with their service bills a red and green folder as illustrated. Fifty thousand are to be distributed

San Diego Show

Annual Christmas Exposition held by Bureau

You'd have thought a world's fair going on again in Balboa Park in San Diego during the week of Nov. 29 to Dec. 3. It turned out to be the Bureau of Radio and Electrical Appliances conducting its annual Christmas Exposition in one of the large exhibit buildings of the fair grounds. The crowds, the color and lighting, the exposition atmosphere were such that any World's Fair might be envious.

More than 110,000 people crowded into the exhibit building, filled the exhibitors' booths, watched the demonstrations and stunts, gathered around the central platform for the door prizes, and while in the mood, purchased liberally of electrical appliances for Christmas gifts, and fully enjoyed the show.

The customary technique was used in staging the show. The Bureau, under J. Clark Chamberlain, manager, offered exhibitor spaces with uniform backgrounds and decorations, electric power for operation of their appliances, staged special features to attract the public, and lead the way with plenty of advertising spread. Every inch of exhibit space was occupied and there are plans of a bigger building for next year's show.

Among the attention-getting features were a fire department display showing the operation of fire alarm boxes, "Willie Vocalite," the Westinghouse robot from the San Francisco Fair, General Electric Co.'s midget Sun and House of Magic demonstration, an adequate wiring demonstration, a spectacular lighting exhibit, miniature electric trains, radio controlled garage doors, plus demonstrations of all kinds.

Future Campaigns

1940 schedules call for concentrated sales efforts

Programs streamlined to meet new sales trends, and ideas which will undoubtedly react favorably when customers are approached, make up the new year's sales stories. Here are a few:

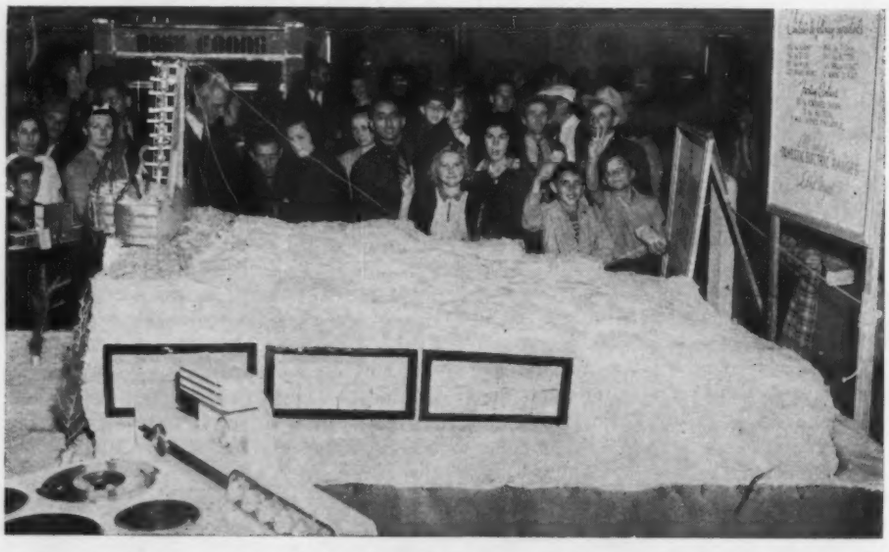
British Columbia Electric Railway Co.—Auxiliary electric heater campaign for Jan. and introduction of 1940 Dealer Plan. Nothing scheduled as yet for Feb.

Bureau of Power & Light—Water heating campaigns for Jan. and Feb.

Pacific Power & Light Co.—Outlets and lighting campaigns for Jan. Washers and ironers for Feb.

Southern Colorado Power Co.—IES clearance sales for Jan. Iron and IES campaigns for Feb.

Utah Power & Light Co. and subsidiaries—Lighting, home laundry campaigns for Jan. Lighting, home laundry and range unit campaigns for Feb.



Fourteen hundred pounds of electrically-baked cake were built into a toothsome replica of the Roberts Market, Santa Monica, for a recent birthday celebration of the food center. The huge pastry was made by Mrs. Ethel Rogers, well known home economist on the Roberts staff. The cakes were baked in two domestic electric ranges in three days, and were served to a large crowd at the celebration. Youngsters were lured to this exhibit like bees to honey

1940 Sales Guides

Re-opening way to sales will be new theme

Entering its fifth year with this issue, ELECTRICAL WEST's Sales Guide will treat with methods for re-opening the way to a sale. The suggestions embodied in the Sales Guide will be applicable either when a prospect has turned down the sales presentation, put off a decision to buy until later, or otherwise given the salesman a refusal to act immediately.

Sales Guides in ELECTRICAL WEST began five years ago with a series of "sales talks that sold appliances." In these the experience of a master salesman in presenting his sales story in respect to each of the major appliances was given in a short case history. The second year series continued in the same idea under the general title "Short sales talks that hurdle sales resistances," except that in January 1936, the four-page India paper appliance Sales Guide appeared as an insert in the magazine. The 1938 series told what to do "when the prospect says no."

In 1939 the copy was made much more concise and easy to read and the four pages of the Guide contained: "What it means to you" (to the dealer and salesman) in respect to each of the appliances covered, "What to say," a quick review of the benefits to be offered by the appliance, and "What to do," short practical suggestions within the capacity and finances of any dealer.

The 1940 series will concentrate on the re-opening technique. Re-styled to enhance the feeling of briefness and conciseness, the copy will be tested sales presentation ideas gathered from experienced salesmen throughout the West. The test of all materials will be, "is it the practical thing to do?"

In order to dramatize the usefulness of the Sales Guide, ELECTRICAL WEST'S Associate Editor, W. A. Cyr, will make a trip in late January, February and March throughout the Northwest. Dealer meetings will be addressed in Pocatello, Payette, Boise, and Twin Falls, Idaho; Salt Lake City and Ogden, Utah; Pueblo and Denver, Colo.; Caspar, Wyo.; Billings, Great Falls, Butte and Missoula, Mont.; Spokane, Pullman, Coeur d'Alene and Lewiston, Idaho; Seattle, Bellingham, Everett, Olympia, Chehalis, Wash.; Portland, Salem, Medford and other Oregon cities. Local announcements of dates and meeting places will be made by the utility serving those areas. "Gadgets may get you if you don't watch out," is the title of the one-man show. In it Cyr will have fun with demonstration gadgets, illustrating both the right and wrong way of using them in sales presentation. Performances may also be made later in the spring to California dealer meetings.

Acknowledgment is made to the following who have contributed unusually good selling ideas and methods from their practical experience during 1939. H. H. Courtright, Kenneth Hampton, and J. U. Berry of Valley Electric Supply Co., Fresno; Ed Conroy, Collonan Electric Co., San Francisco; W. E. Derbyshire, Graybar Electric Co., San Francisco; Bill Lancaster, L. J. Meyberg Co., San Francisco, and Clyde Allen, Electric Kitchen Appliance Co.

APPLIANCE SALES REPORT, 1940

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1]		Northwestern Elec. Co.[2]		Montana Power Co.[3]		P. G. & E. Co.[4]		San Diego Cons G. & E. Corp.[5]		San Joaquin Power[6]		Southern Calif. Edison Co., Ltd.[7]		Utah Power & Lt. Co.[8]		Wash. Water Power Co.	
	Current	11 Mos.	Current	†Mos.	Current	10 Mos.	Current	10 Mos.	Current	11 Mos.	Current	11 Mos.	Current	11 Mos.	Current	11 Mos.	Current	11 Mos.
Ranges	217	3,272			137	1,123	338	3,247	135	453	110	1,281	147	1,886	246	3,240	189	2,426
Water Heaters	123	1,578			8	139	237	2,429	44	401	69	672	37	675	42	946	157	2,217
Air Heaters, aux.							439	2,888	271	1,300	72	283						
Air Heaters, 220							121	984			57	559						
Refrigerators	173	4,640			280	5,639	3,519	41,557	460	7,317	90	5,192	1,854	34,470	365	9,084	230	7,208
Dishwashers	3	22					6	120			1	25			2	31	1	5
Washers	357	4,441			557	5,317	2,982	27,157	348	3,900	219	3,445	2,099	25,037	999	8,174	440	5,295
Ironers	21	318			64	579	439	4,647	53	556	23	455	273	3,035	64	541	31	330
Vacuum Cleaners	109	1,370			307	2,097	3,157	26,607	246	3,632	71	918	795	10,927	439	4,007	203	2,356
Radios	1,073	7,919			2,300	13,092	13,133	94,455	1,544	11,575	540	6,411	5,290	50,270	2,074	15,968	2,093	16,996
Mixers	102	683					303	2,674	198	1,307	38	415	295	2,565	182	1,368	187	1,397
Cookers, Casseroles	32	337			22	307			63	539	4	42	19	401	9	123	187	2,996
Irons	585	5,524							522	4,747	229	2,863	926	11,168	1,189	10,320	806	7,290
Waffle Irons	196	1,358							183	1,854	79	833	363	3,328	411	3,388	306	1,949
Toasters	385	2,572							427	3,860	74	1,227	549	5,295	707	3,937	771	4,504
Table Stoves	107	3,078			935	8,295			66	701	18	269	177	2,094	212	3,531	103	1,398
Heating Pads	173	907							137	1,093	42	361	186	1,487	377	1,770	177	997
Curling Irons													47	413	324	1,427		
Coffee Makers	254	2,208							449	3,953	117	1,291	224	2,840	179	1,595	626	4,284
Sewing Machines							651	4,928	132	1,228	12	131			157	1,868	108	920
Clocks	176	1,457							406	3,666	143	1,428	491	4,961	390	3,069	366	2,523
Fans	25	2,053									5	748	23	3,728	31	1,679	28	2,768
Floor Polishers																		
Sun Lamps	33	214											29	339	10	80	6	112
Reflector Lamps	1,411	4,945									191	1,889						
Misc. Lamps	720	6,463																
Shavers													187	2,116				
Yard Lights											27	455			40	302		

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Lists appliances sold by dealers in Portland area. Figures compiled by Northwestern Electric Company.

[3] Combined dealer and company sales from report of Montana Power Co.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. * Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

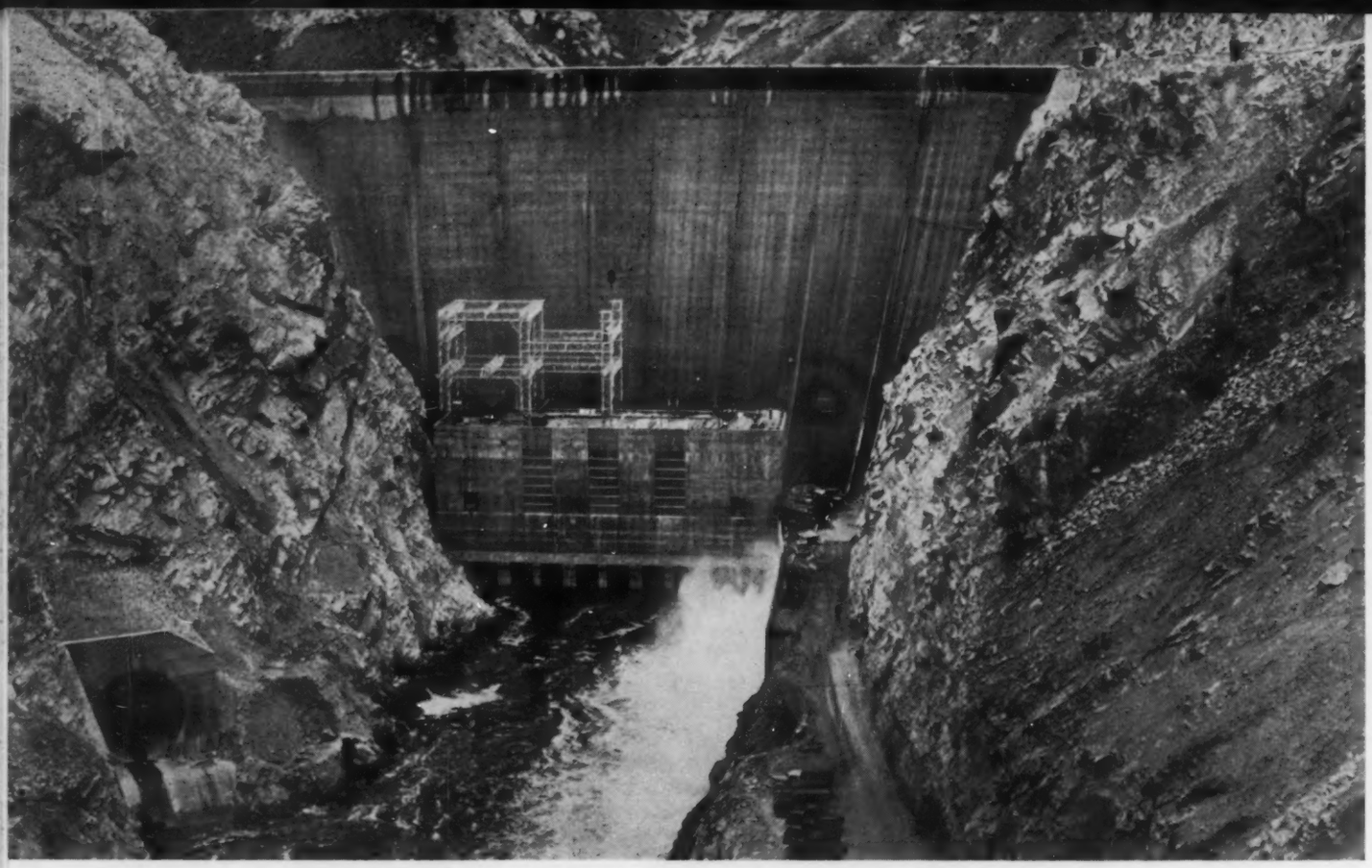
[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures include fans, curling irons and sun lamps.

[6] Compiled from dealer reports by Merchandising Division of San Joaquin Power.

[7] Includes reports from dealers on San Joaquin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

† November figures were not available at time of going to press.



SEMINOE Dam and power plant are situated on the North Platte River, 73 mi. from Casper, Wyo., and 37 mi. from the nearest railroad connection. The development serves the dual purpose of storing water for irrigation and generating electric power to meet the growing demand in southern Wyoming and northern Colorado.

The dam is of the concrete arch type, 261 ft. high above its foundation and 560 ft. long at the crest. The storage reservoir has a capacity of 1,000,000 acre-ft. The spillway at the dam is controlled by two motor-operated roller-type gates. A 30-ft. diameter spillway tunnel connects the spillway with the river below the powerhouse. The release of irrigation water is controlled by two 60-in. needle valves in the power house.

The power house is of reinforced concrete construction and is immediately below the dam. The entire dvelopment was designed for the greatest simplicity and economy, both in first cost and operation. Although classified as a manually-operated plant, the important functions are arranged so that the plant can be operated by one operator per shift.

Turbines and Governors

The turbines are of the vertical-shaft, single-runner, Francis type, rated 15,000 hp. at 225 r.p.m., when operating at 171-ft. head. Because of the necessity for furnishing water for irrigation requirements, head may vary from approximately 113 to 218 ft.

The steel penstocks are 102 in. in diameter at the powerhouse and have motor-operated gates installed ahead of the turbines. Trashracks and a bulkhead gate operated by gantry crane on top of the dam are provided on the upstream face at penstock intakes.

Among hydro plants designed by the U. S. Bureau of Reclamation, that at Boulder has the most complicated equipment for control. Plants designed since Boulder have been subject to a trend away from great complexity. In this respect, as well as, roughly, in its size, Seminoe is representative of a group of hydro plants being or to be engineered by the USBR.—Editor

Each turbine guide-bearing is oil-pressure lubricated by an a.c.-motor-driven oil pump and an emergency d.c.-motor-driven oil pump. The d.c.-motor-driven pump is automatically started on occurrence of low lubricating oil pressure provided the turbine is in operation, and continues to run until shut down by the operator.

Except for the automatic feature described above, the lubricating oil pumps located in the turbine pit are manually controlled. A thermometer indicates the bearing temperature, and a thermostat operates a high temperature alarm. The turbine wicket gates are operated by double, oil-pressure-operated servomotors, controlled by the governors.

Governors are oil-pressure, relay-valve, actuator type with oil pump, oil sump, and governor mechanism for each unit mounted in a common cabinet as shown in Fig. 2. Each governor oil-pumping unit normally supplies oil pressure to its associated unit but interconnected piping is provided so that one pump can supply oil pressure to two units. The governor-oil-pump motor is a.c.-operated, pressure-switch-controlled, and maintains oil pressure automatically at all times, whether the unit is running or not.

Governor fly balls are driven by an a.c. motor from a permanent-magnet generator direct-connected to the top end of the main generator shaft. Mechanical controls are provided at the governor cabinet for adjusting the turbine-gate limit, speed droop, speed level, and for starting and stopping the turbine. Indicators show generator speed, gate position, oil and air pressure.

Each unit is arranged for starting and stopping from the governor, and a solenoid is provided for automatic shutdown by the protective relays. The speed indicator is electrically operated from a magneto-type generator mounted

Seminoe's Control Typical of Newer USBR Plants

By E. C. Schurch

at the top end of the main generator shaft. The speed level of each unit is adjusted from the main switchboard by means of selsyn devices, which also provide indication of the position of the speed level adjustment.

Generators and Exciters

Each of the three generators is rated 12,000 kva., 6,900 volts, 0.9 power factor, three-phase, 60 cycles, and is of the conventional vertical-shaft type. The stator frame is supported on a concrete pedestal built up from the generator floor. The platform on top of the unit is level with the generator-room balcony. The generator room is shown in Fig. 1.

Each generator is provided with two guide bearings and a thrust bearing, having self-contained oil reservoirs and oil-circulating systems. Dial-type thermometers with electrical contacts are used to indicate bearing temperatures and operate high temperature alarms. Air brakes are provided for stopping the rotor.

Standard resistance-temperature detectors are provided in the stator winding to indicate temperature at the switchboard.

A shunt-wound 250-volt main exciter and a compound-wound 125-volt pilot exciter are direct-connected to the upper end of the generator shaft. The armature circuit of the main exciter is connected directly to the main-generator field-collector ring brushes. The excitation is varied by means of a motor-operated rheostat and high-speed contactors connected in the main-exciter field circuit. The pilot-exciter voltage is held constant.

The voltage-regulator master element located on the remain control board is actuated by a 3-phase torque motor and controls the main-exciter rheostat and contactors of the high-speed excitation system. The excitation may be controlled either manually from the switchboard or automatically by means of the voltage regulator. A field circuit breaker is connected in the main-exciter field circuit, arranged to be automatically tripped by means of the generator differential relays. Excess pilot-exciter voltage is prevented by the opening of an overspeed switch contact which inserts additional resistance in the pilot-exciter field circuit.

6,900-Volt Switchgear and Bus

A single-bus system with one sectionalizing oil circuit breaker was chosen for Seminoe power plant because of its simplicity and low cost and the probability of failures was reduced by using 15,000-volt insulation and careful design throughout. The 6,900-volt switchgear and bus are of the metal-clad type, illustrated in Fig. 4. The oil circuit breakers are of the vertical-lift, metal-clad type, rated 1,200 amp., 15,000 volts, 250,000 kva. interrupting capacity, with 125-volt, direct-current, solenoid operating mechanisms. Each oil circuit breaker is located in a separate steel enclosure with its associated current and potential transformers.

The bus bars and all 6,900-volt conductors, including joints, are covered with bakelite insulating material, rated 15,000 volts. Potential transformers with fused disconnecting switches and current-limiting resistors are mounted in a compartment at the top of each oil-circuit-breaker enclosure.

Interlocks are provided so that the breakers cannot be removed from or

Fig. 1—Generator room, visible through control-room windows

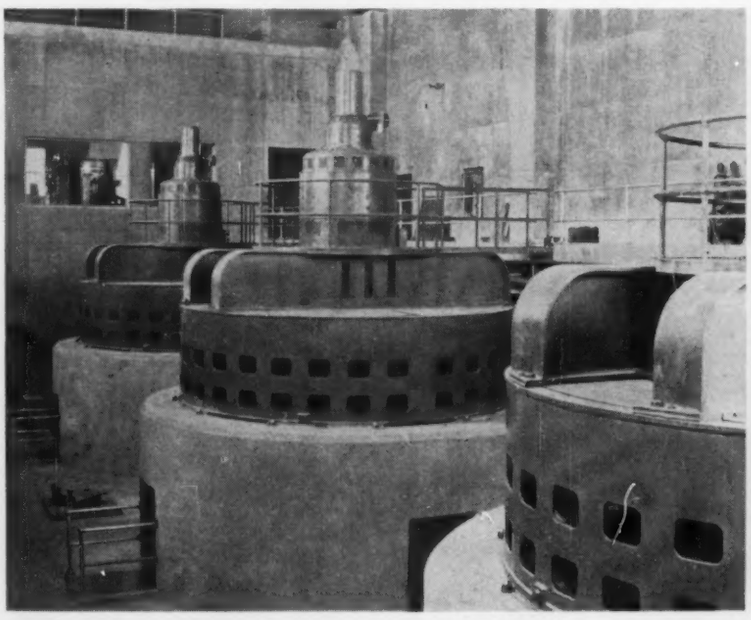
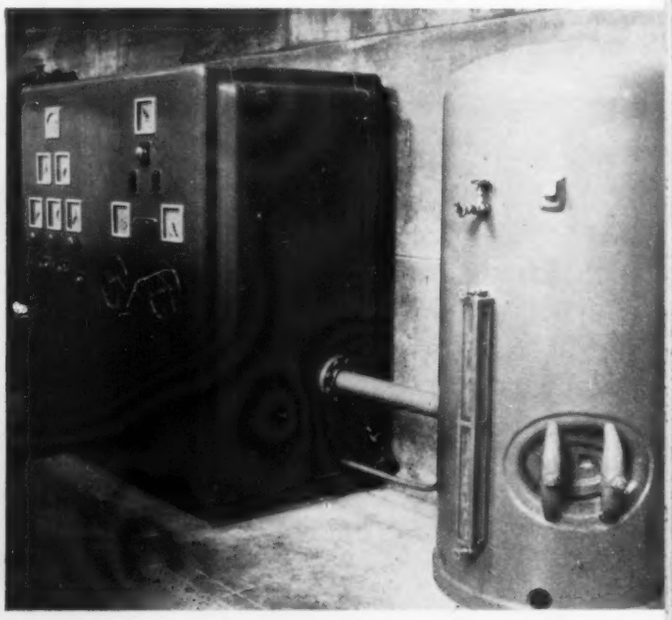


Fig. 2—Governor mechanisms are mounted in a common cabinet



returned to the operating position when closed, or closed when being moved from or to the operating position, and the tanks cannot be removed unless the breaker is withdrawn from the operating position. Removal of a breaker is accomplished by lowering onto a portable truck by means of a portable motor. A test panel is provided, to wihch a removed breaker can be connected for operating tests and adjustments.

The main conductors to the generators and transformers are insulated cables supported on racks and in conduit respectively. The control cables enter the rear of the switchgear from a metal duct and connect to terminal blocks at the rear of each section.

Main Power Transformers

The three main - power - transformer banks are placed outdoors between the powerhouse and the dam. The banks are rated 2,000, 7,500 and 30,000 kva., respectively, for the 34.5-, 57,- and 115-kv. lines. A transfer track provides means of moving the transformers into the powerhouse for untanking and substituting spare units. All transformers are the oil-immersed, self-cooled, conservator type.

Each of the three banks is connected delta on the low-voltage side and star on the high-voltage side, with solidly grounded neutrals, except the 30,000-kva. bank, which is normally grounded through a Petersen coil. The Petersen coil is also oil-immersed, self-cooled.

High-voltage leads from the transformers are carried to the powerhouse roof where high - voltage switching equipment is located. Bushing-type current transformers are provided in the 2,000- and 7,500-kva. bank neutral bushings for operation of line ammeters and ground relays. Dial-type thermometers with alarm contacts are used to indicate oil temperatures and operate high-temperature alarms.

High-Voltage Equipment

The 2,000- and 7,500-kva. transformer banks are connected directly to their respective lines through disconnecting switches. An oil circuit breaker of the conventional type with bypass and disconnecting switches is used on the 115-kv. line. Each line is equipped with lightning arresters, and coupling capacitors for carrier-telephone communication. The 115-kv. capacitor also serves as a line potential device.

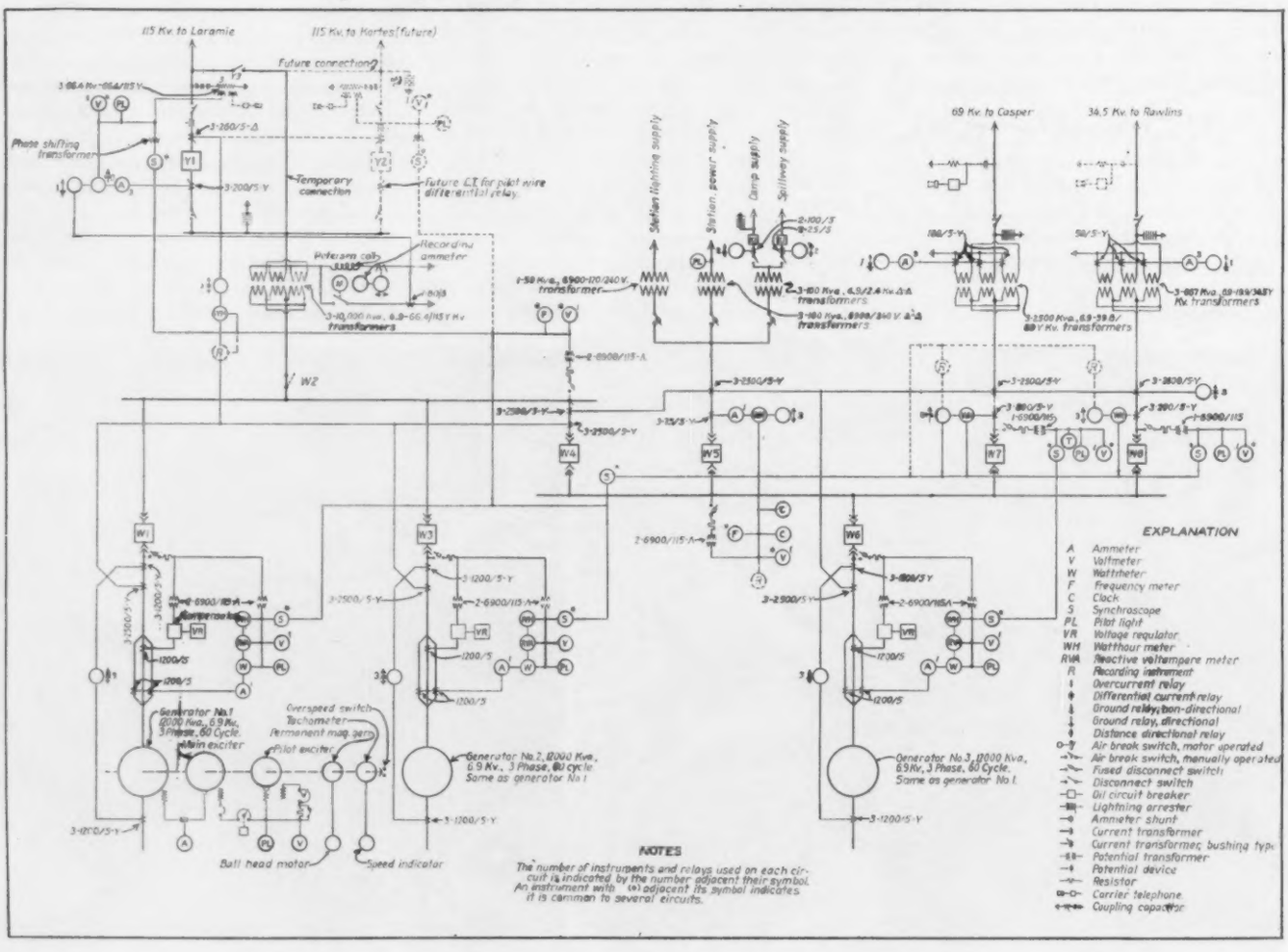
Station-Service Equipment

Power for station service, lighting, spillway and camp is supplied from the main bus through an oil circuit breaker and fused disconnecting switches. Station-service power can be supplied from any of the three transmission lines in case all Seminoe generators are out of service. The station-service power and lighting transformers are located in a vault near the 6,900-volt switch-gear. Two 2,300-volt, 3-phase circuits with oil circuit breakers and overload relays are provided for supplying power to the camp and spillway, respectively.

Station-power circuits are all 240-volt, 3-phase, distributed to the unit auxiliaries and other equipment from a switchboard located on the generator floor. The distribution switchboard is a completely enclosed steel-panel type having air circuit breakers of the completely enclosed dead-front type with thermal overload stripping device for each branch circuit.

Distribution cabinets are located at several places in the power plant for

Fig. 3—Single-line diagram of the control system for Seminoe power plant



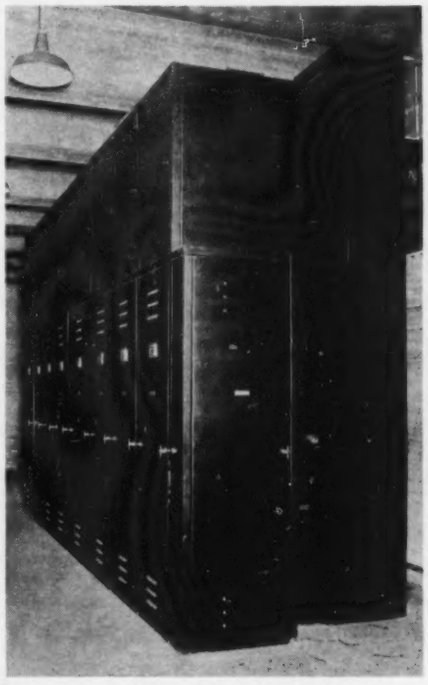


Fig. 4 — Metal-clad 6,900-volt switchgear. Each oil breaker is separately enclosed with associated current and potential transformers

further division of the circuits. Air circuit breakers of the same type used in the main distribution board are used in the distribution cabinets. The heating requirements for the building are obtained from electric space heaters. These are portable, 3-phase, rated from 5 to 9 kw., can be connected to 3-phase outlets wherever needed. An electric water heater supplies hot water.

125-volt D.C. Control Supply

A 60-cell, 13-plate, lead-acid type, 125-volt storage battery is provided to supply control power, emergency lighting, and emergency lubricating oil pump power. The 125-volt circuits are distributed from the station-power switchboard by means of dead-front, completely-enclosed air circuit breakers with thermal overload protection. The battery charging equipment consists of one copper-oxide rectifier for continuous service and one mercury-vapor, tube-type rectifier for emergency service. The two rectifiers with associated charging rate adjusting equipment and instruments are mounted on the end of the station-power switchboard. A vernier adjusting device for charging rate is provided on the main control board for the copper oxide rectifier.

Main Control Board

The main control board is located in a room at the end of the powerhouse, separated from the generator room by a glass-windowed partition, affording the operator a full view of the generators. It consists of six front and six rear panels of 1/8-in. steel, 28 in. wide and 90 in. high, and a terminal-board section between the front and rear panels. Doors in the end enclosures of the control board afford access to the rear of the panels and the terminal-board section. A front view is shown in Fig. 5.

Meters, instruments, annunciators and other devices necessary for controlling the generators and oil circuit breakers are mounted on the front panels, and the protective relays and other auxiliary equipment on the rear panels. Test switches are provided on each panel, arranged to transfer the meter and relay circuits to test terminals at the bottom of each panel.

A group of annunciator drops is provided on each front panel. These are used in conjunction with an alarm horn to warn the operator of such abnormal conditions as hot generator or turbine bearings, low lubricating-oil pressure, low governor-oil pressure, generator overspeed, automatic tripping of circuit breakers, hot transformers, and Petersen coil operation. System frequency is adjusted manually with the aid of a time-error clock.

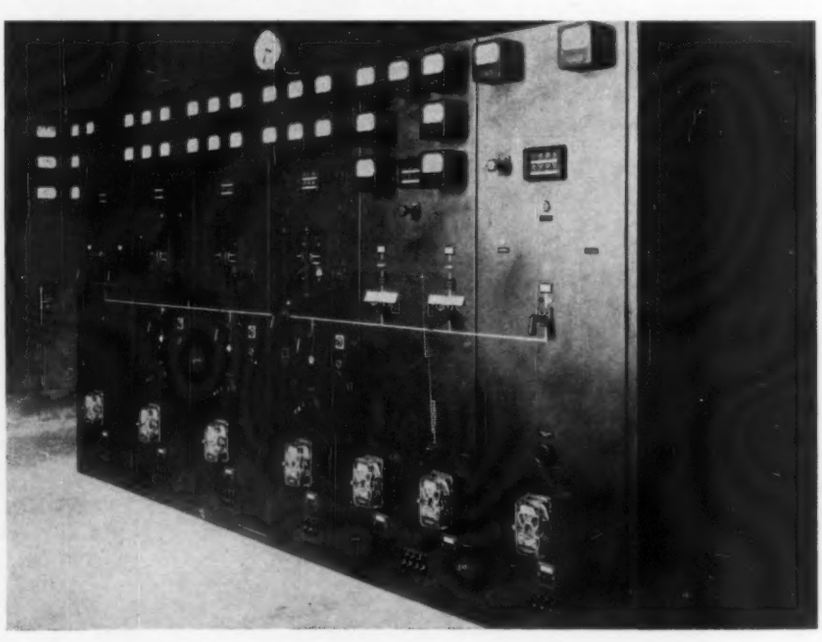
Control cables approach the switchboard through slots in the floor directly beneath the terminal-board section. They are supported just above the floor in wooden clamping blocks with the lead sheath terminated just above the blocks. The individual conductors are bound into packs and supported on the cross bars to which the vertical rows of terminal blocks are attached. The conductors from the terminal blocks to the front and rear syitchboard panels pass through overhead ducts.

Each conductor is designated at the terminal blocks and at other points where needed by a code designed to simplify installation and maintenance. Combinations of letter designations are abbreviations of the service for which they are used, such as "BVA" for "bus voltage phase A."

Control Cable Racks

Control cables from the main switchboard to the respective equipment are carried in open cable trays, with the exception of a few cables running to the high-voltage equipment on the roof and other remote points, which are in conduit. Substituting cable trays for embedded conduit resulted in considerable saving in cost and also simplified the concrete construction by eliminating the placing of a large number of embedded conduits. The use of cable trays also permitted greater flexibility in the control scheme, since additional cables can be readily added in the future should additional equipment be installed. The cable trays consist of ebony asbestos sheets supported by angle-iron frames attached to the ceiling below the switchboard and under the generator-room balcony to each generator, actuator, the switchgear, and other equipment. The control cables are all lead-covered multiconductor cables of No. 19/25 or 19/22 wire with 600-volt insulation. The circuits for

Fig. 5—Control board, located in a separate room from which generators can be viewed. Test switches permit transferring meter and relay circuits to terminals at the bottom of each panel. Protective relays, other auxiliaries are on rear panels



lighting and station power are carried in conduit, most of which is embedded.

Power Transmission System

The power transmission system consists of three single-circuit transmission lines. A 34.5-kv. line to Rawlins, Wyo., supplies power to the Rawlins Electric Co. A 69-kv. line, now operating at 57 kv., connects to the Mountain States Power Co. at Casper, Wyo., which in turn is interconnected with the North Platte system of the Bureau of Reclamation. A 115-kv. line connects with Public Service Co. of Colorado at Cheyenne, Wyo., and Greeley, Colo., and with the North Platte system of the Bureau of Reclamation at Gering, Neb., and with Western Public Service Co., at Laramie, Wyo. An interconnection will be made at Greeley, Colo., in the future, with the Colorado-Big Thompson system of the Bureau of Reclamation.

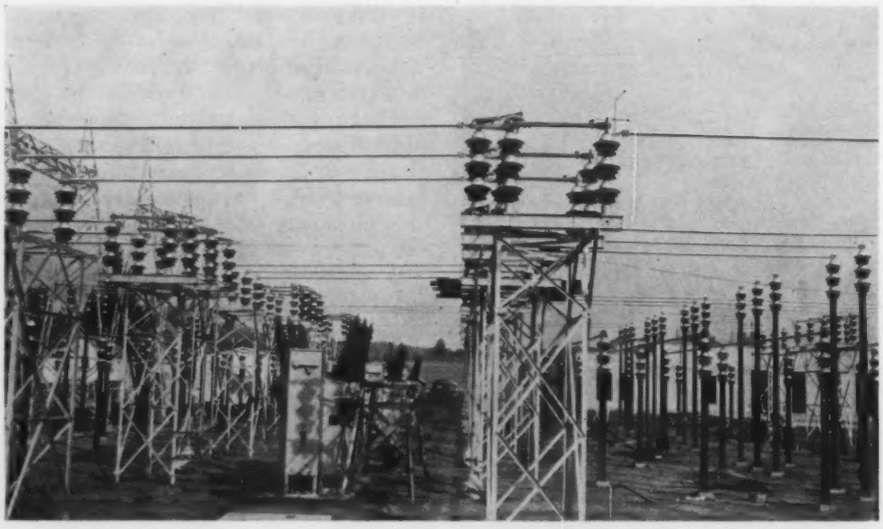
System Protection

As indicated by reference to the single-line diagram, Fig 3, the current transformers used for protective relays are overlapped so that no part of the system is left unprotected.

Each generator is provided with induction-type ratio-differential relays arranged to trip the generator oil circuit breaker, field breaker and shut down the unit. The 6,900-kv. bus is protected by a differential connection of induction-type overcurrent relays, which trips all oil circuit breakers within the protected zone. The 30,000-kva. transformer bank is protected by induction-type ratio-differential relays arranged to trip the high- and low-voltage oil circuit breakers. Induction-type overcurrent relays are provided on the Rawlins line and station-service feeder. High-speed, directional - impedance relays of the 3-zone type are provided on the Casper and Laramie lines.

Ground protection on the three lines consists of induction-type ground relays with directional feature on the Laramie line only. The Laramie line is also provided with a Petersen coil which operates in conjunction with a Petersen coil at Gering, Neb., and Greeley, Colo., the line terminals.

A bypass switch with high-speed closing feature is connected around the Petersen coil to ground the system solidly after a time delay of approximately 10 sec. in case the Petersen coil fails to clear the ground fault. Closing of the bypass switch is controlled by an instantaneous overcurrent relay and an induction-type time-delay relay. A control switch is provided on the switchboard for manual control of the bypass switch. A recording ammeter in the ground connection provides a record of line-to-ground disturbances.



AMPERE SUBSTATION, under construction by the Bonneville Administration at Vancouver, Wash., is an important link in the transmission system. Rated 230/115 kv., star-star, it will have 75,000 kva. in transformer capacity installed. The buses are of tubular aluminum

Meter Saving

120-volt coils adapted to 240 volts by closing air gap

By L. R. SPAULDING
Northwestern Electric Co.

In the program of meter rebuilding which it has been carrying on for several years, Northwestern Electric Co. has found the principal item of expense to be the purchase of a new 240-volt potential coil. Northwestern's program encompasses the conversion of a surplus of 2-wire, 5-amp., G-E, I-14 meters into 3-wire, 25-amp. sequence meters.

Now, a way has been found to use the old 120-volt potential coil for 240-volt service and thereby avoid spending $2.60 per meter for new coil and iron. This is accomplished by taking the 120-volt coil, which formerly was discarded, and altering its air gap, thereby altering its magnetic reluctance and hence its inductive reactance.

The two air gaps in the core are closed uniformly with laminations of iron which have permeability curves such as to give reasonably accurate meter performance under all operating conditions. The alteration introduces some error by reason of the voltage curve, but this is not considered serious in view of the close limits to which voltage is regulated on most systems today.

If a standard 120-volt coil were placed across 240 volts in a 3-wire meter, an excessively large current would be drawn and the coil would be overheated. This alone would be costly, but, in addition, erroneous readings would result from the fact that the disc torque would be doubled.

By partially closing the air gap in the core, the reluctance of the core is decreased, and more flux is allowed to flow in the magnetic circuit. This tends to increase the inductive reactance of the coil. Thus it will still pass its normal amount of current when placed across a higher voltage.

Reducing the air gap also decreases the amount of leakage flux applying torque to the disc; thus disc revolutions remain normal.

Alteration of the core is accomplished by inserting a small wedge in the air gap.

Since both the 120-and the 240-volt coils normally are tested at the same voltage to ground (1,000 volts), the 120-volt coil can be operated with safety on 240 volts.

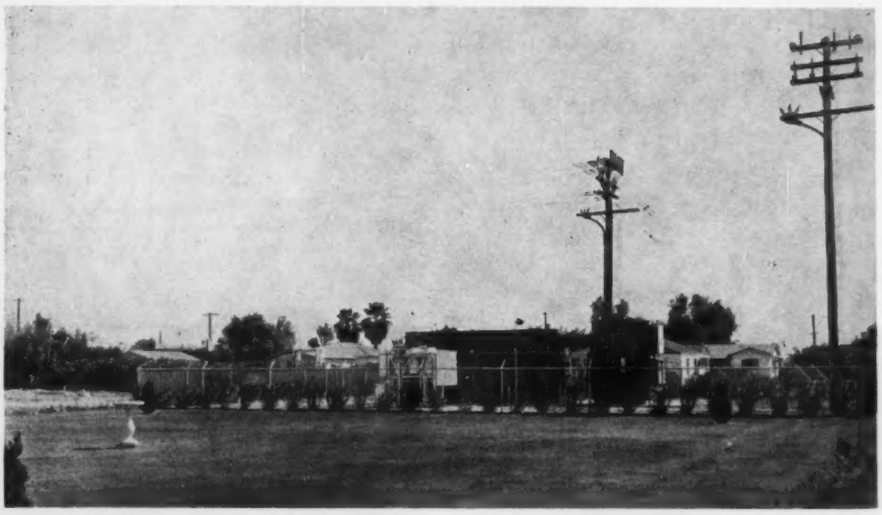
Although accuracy curves for these special, rebuilt meters at various tem-

Table I

	I-14 (Special)		I-14 (Standard)		C.S. (Standard)	
Temperature	100% PF	50% PF	100%	50%	100%	50%
70°F.	100	100	100	100	100	100
100°F.	100.7	99.6	100.5	96.5	100.2	97.2

Table II

	Milliamps. Passed	Watts	Temperature	Magnetic Lines Per Sq.In. of Core
Std. 240-volt coil, G-E I-14 on 240 volts.	55	1.7	24°C.	
Special 240-volt coil on 240 volts.....	110	2.7	29.5°C.	Approx. 2x Std. Coil
Std. 120-volt coil on 120 volts.....	110	1.7	24°C.	



CENTRAL ARIZONA Light & Power Corp. recently has been installing unit-type substation equipments on its Phoenix distribution system. Because Phoenix property values are not excessively high, spacious landscaping is practicable. A "park" like this is an asset to nearby property

peratures have not been completed, tests made at two points (70° and 160° F.) indicate accuracies within practical limits.

Comparative data are shown in Tables I and II. All tests were made at full, rated load, and temperature-correction shunts were placed in all magnets.

The I-14 potential coil seems to be the one most suited to this type of conversion because its large iron core permits doubling the flux without approaching saturation. There are, however, other meter potential coils which can be so changed with slight variations from the method described.

Meters so converted are now in use in a number of districts in Oregon and Washington. The shunt can be installed in about the same time ordinarily spent in changing potential leads from the old 120- to the new 240-volt coil. Hence, no additional labor need be charged to the job if the work is done when changing the meter to sequence type.

A patent on this conversion scheme is being sought.

Television

Why the world's latest wonder is growing slowly

Reports are that since television broadcasting was begun in New York last summer, not more than 1,000 receivers have been sold in the New York reception area—a showing that hardly matches the progress of radio when it was in a comparable stage of development.

Among the things which have limited television's growth is thought to be the fact that so far only one program has been available—through NBC. Columbia is tentatively scheduled to begin broadcasting Feb. 1, and an increase in receiver sales, but not a sharp increase, is expected.

Meanwhile RCA conducted a test campaign on sales of television receivers with prices reduced up to 35%. Observers believed the tests showed that price is a serious obstacle to sales, and a good market can be found at $200.

On the broadcasting end, better service is felt to be forthcoming by reason of new RCA cameras, which are said to produce clear images even on dark days, and which by virtue of lighter equipment (five 75-lb. cases) are expected to allow camera crews greater mobility.

For Hot Hi-Lines

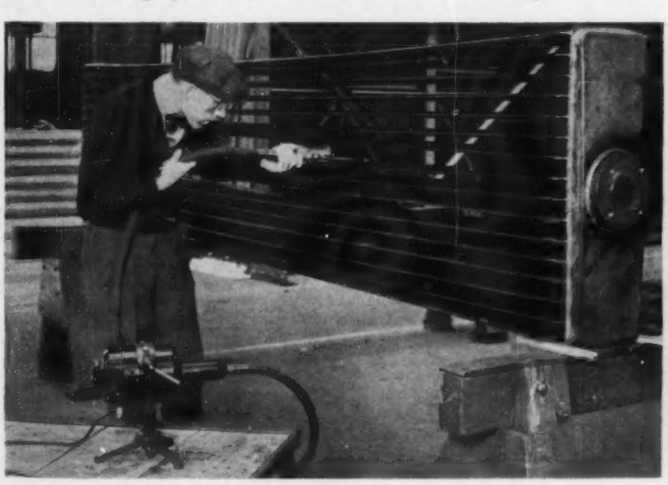
Split-core ammeter can be manipulated with hot-sticks

Pacific Gas and Electric Co. reports successful experience with a new type of ammeter which, by means of hot-line sticks, is useful in taking measurements on high-voltage, energized lines. Main uses have been on distribution circuits, but the device could be used up to 11 kv. or more.

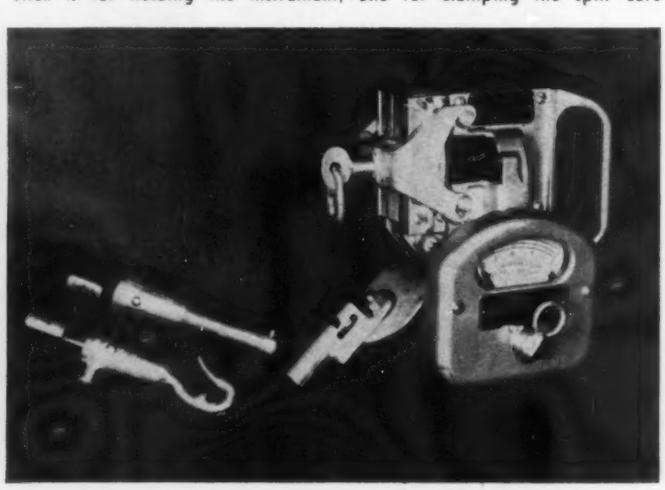
The device consists of a Lincoln maximum-demand meter, which is made up and furnished with a multi-range, split-core current transformer by HD Electric Co. Attachments for use with hotsticks are put on by Safety Live Line Tool Co., Oakland, Calif. Chester Coon, of this organization worked out the design at the request of PG and E engineers. The assembly is being furnished by L. A. Nott & Co., San Francisco.

Two connections on the instrument provide for handling with sticks. One is a sleeve, bracketed to the chassis of the instrument, into which a stick may be inserted for holding and moving the instrument. The other is a screw and link which is operated by a stick with a hooked end to manipulate the core.

CLEANING TRANSFORMER PARTS, such as tanks and radiator surfaces is simplified by a portable tool introduced by Westinghouse. It consists of a ½-hp. motor, 8-ft. flexible shaft, interchangeable wheels



HOT-STICKS (see text above) are used to manipulate this split-core ammeter, which thus can be applied to live, high-voltage lines. One stick is for holding the instrument, one for clamping the split core



Pepco's Radios

By W. A. Leidigh, Jr.

LAST October the Federal Communications Commission authorized Portland General Electric Co. to operate fixed and mobile radio transmitters for special emergency. Following a period of many months, during which the company had been developing and constructing its equipment, this action made Pepco the operator of a large, space radio network. Since then, transmitters have been put to use by the operating department, and "special emergency" radio has become a regular part of the company's communication system.

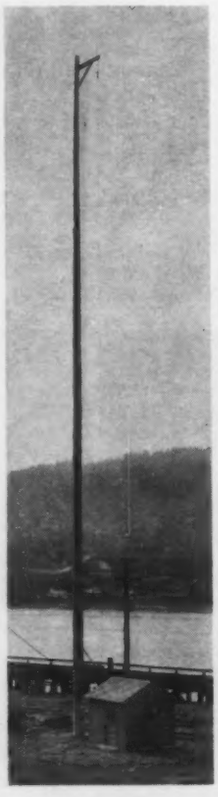
(Above) Radio-equipped patrol car in action. (Below) By placing the transmitter at the antenna (vertical radiator supported by 125-ft. cedar pole) antenna leads are eliminated

Pepco's distribution network covers approximately 3,300 sq.mi. and serves 136,000 customers. It is estimated that the electric service to at least 100,000 customers throughout 2,500 sq.mi. will benefit from the new radio system. Further expansion, with addition of other fixed units under control of rural district offices, will no doubt be the solution to complete and dependable coverage.

At present, ten emergency trouble cars are equipped with mobile receivers and can be called from their routine work at the instant breakdown occurs. One special-emergency two-way mobile unit with transmitter is also in constant touch with the system load dispatcher. Other similar mobile transmitters are contemplated, thereby extending the same communication facilities to all emergency repair cars.

Primarily interested in emergency trouble-car dispatching and hydro-plant contacts from the fixed station and finding congestion of other services on and near the "special emergency" channel of 2,726 kilocycles, the assignment at 2,292 kilocycles was chosen. The fixed transmitter is a composite, locally-built unit, crystal-controlled and Class-B-modulated, with an output capability of 150 watts, FCC rating. The required 50 watts is maintained, however, due to the power limitation on the operating channel.

The antenna consists of a one-quarter wave vertical radiator supported by a 125-ft. cedar pole. An elaborate radial ground system is used to increase radiation efficiency and produce beneficial low-angle wave propagation. The transmitter is housed in a small wooden structure at the base of the pole, thus eliminating antenna feeder lines. Thermostatically controlled electric heat maintains room temperature at approximately 70° F.



The station is entirely automatic, no operators being required at the transmitter. The control point is located in the central office building at the system load dispatcher's desk, one mile from the transmitter.

Voice input to the transmitter is equalized to permit only those frequencies producing maximum understandability to enter the modulation system. Such practice is general where high fidelity is not required and maximum coverage is demanded from a low-power transmitter.

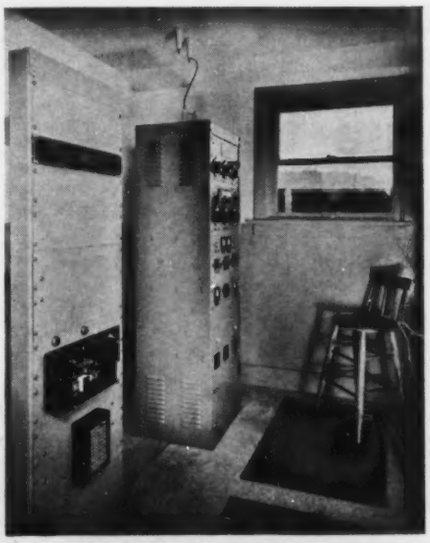
Construction permit tests under summer midday conditions showed satisfactory coverage of 40-mi. radius to moving mobile units where power line disturbance was not excessive. Hydro plants with good receivers reported understandable signal strength at air line distances of 50 mi. under same conditions. Similar tests conducted at night brought reports of much greater signal strength and increased range.

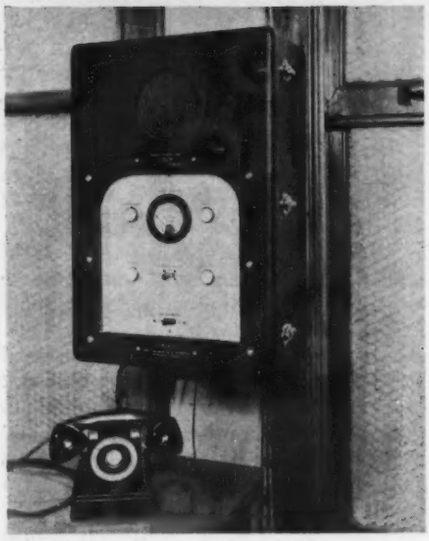
Dependable city-wide coverage is assured at any time, due to the central location of the transmitter, and "received" signals are far above any noise level encountered.

The two-way unit is installed in a coupe-type automobile. The transmitter is a type H, model 1-1B, Radio Specialty unit with crystal control and class B modulation. Its output capability is 25 watts, FCC rating, and the operating frequency is 31,740 kilocycles. The one-quarter wave, car-bumper radiator is coaxial fed.

The fixed receiver for 31,740 kilocycles consists of a Pearson Delane communications unit with locally-built crystal stabilizer mounted in one rack. For technical reasons, explained by propagation theories of ultra-high-frequency waves, this receiver is situated on a hill approximately 1,200 ft. above the surrounding country and as close as possible to the center of the area to be covered. The audio output of the receiver is connected with the central office control point, via rented telephone lines.

During construction permit tests, dependable two-way duplex conversations resulted over a radius of 10 to 12 mi. in all directions. In some cases, over comparatively level country contacts were satisfactory up to 60 mi. Hill and





(Above) Interior of the transmitter house. In the foreground is the relay rack, in back the KQEB transmitting equipment. (Below) Load dispatcher's control unit, wall-mounted

mountain shadings which limited the ultra-high-frequency talk-back were observed in some localities. But the fixed station on 2,292 kilocycles was received by the mobile two-way unit practically free of dead spots in all locations where the car was within its transmitting range.

The special-emergency radio network has been in regular service for only a short period, and no storm conditions have been experienced so far. However, with hourly tests to emergency cars and trouble dispatching under normal conditions, 24-hour standby service is demanded of the fixed transmitter.

The EEI interpretation of the FCC limitations for "special emergency" stations has been accepted as the operating guide. Load dispatchers and others using this service now hold radio-telephone operators' permits, and the entire radio system is under the control of a first-class radio-telephone operator.

Communication engineers familiar with the congestion on the special emergency channel at 2,726 kilocycles cannot too forcibly impress upon the users and future applicants for either of the two full-time medium frequency assignments, the importance of proper antenna design. Careful consideration of this problem not only facilitates the communication desired, but is the step toward that necessary cooperation with other services using the same channel.

The low-angle radiation characteristics produced by the fractional-wave, vertical-type antenna, with proper ground system, are ideal for trouble dispatching purposes. The low power limitation on the 2,292 kilocycle channel should not be considered as a service limitation; the tendency will be to create better unit efficiency for the service desired, resulting in reduced interference when the channel becomes congested.

Airplane Power

Air men study light-weight electrical equipment

"AC for Aircraft", an article in *Aviation* by P. C. Sandretto, superintendent of United Air Lines' communications laboratory, in summing up recently collected data on electric power systems for airplanes, presents information which holds interest for other electrical men as well. Demands for power in large planes have been increasing rapidly and to a point where a load of 15 kw. or more is not thought unusual.

Hence, in plane design, nature of the electrical system has become an important consideration, particularly with reference to weight. One set of data was worked out for a sizeable plane to show the relation of voltage to weight of the wiring. It was assumed that No. 20 AWG was the smallest wire which could be pulled through conduit without appreciable risk of damage. This showed that if a 12-volt system weighed 100%, a 120-volt system would weigh 10%, 220-volt 8%.

Relative weights of transformers as a function of frequency were plotted through a range of 60 to 1,000 cycles. These showed an almost straight-line decrease from 100% at 60 cycles to less than 20% at 1,000 cycles. Relative weights of motors of given horsepower, voltage and frame, showed a single-phase motor at 100%, 2-phase 60%, 3-phase 52%, and a d.c. motor 50%.

In the light of these and other factors, the article concludes that, from data available so far, systems operating in the neighborhood of 115 volts at 400 cycles 3-phase, or 800 cycles single-phase, appear to be practical.

Reclosers

Service restorers prove effective in urban service

To reduce outages, both in duration and number, the City of Colorado Springs has applied service restorers to its 6,900-volt urban distribution system. Although no attempt was made to justify the use of the restorers by such means as computing the probable increase in revenue, it is felt the investment was justified by the better public relations which are bound to result from greater service continuity.

In Colorado Springs, each feeder is radial and covers a rather large portion of the city, representing a more or less direct line through the area served, branches from these lines taking care of side areas.

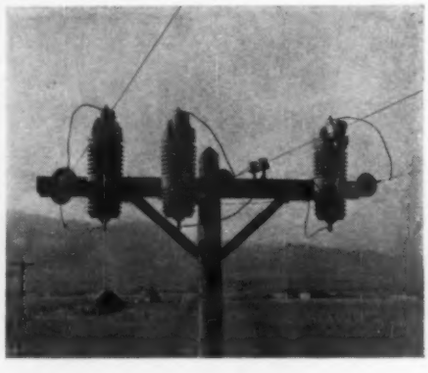
Seven sets of General Electric oil switches were installed in branches of this kind, near the point where a branch joins the main feeder. Switch capacities were determined by taking load charts at the points where they were to be installed.

So far, the period of service has not been extensive enough to yield definite indications of performance, but during the first two months of service, ten restorer operations were registered without interruptions to the main feeders.

It is logical to expect greatest improvement in those cases where lockout will occur, as only a fraction of the service from a feeder will be interrupted. This confining of the outage to a small area will also mean that less patrolling will be needed and that outages will therefore be shorter.

The initial installation was experimental. Experience to date has been satisfactory to the degree that F. H. Wiley, electric superintendent for the city, plans to apply this form of protection to other circuits on the system.

Typical installation of service restorers on the 6,900-volt system at Colorado Springs. Although this installation is outside of town, the applications are to urban feeder branches



A Selling Tool in the New PCEB Kit

Testing apparatus will help to develop new loads by showing inadequate commercial wiring equipment

Walter Heston with the kit he has developed to dramatize the need for adequate wiring

NECESSITY for some means of demonstrating adequate wiring, or to show the effect of inadequate wiring, has been a problem confronting those of us who are endeavoring to develop the tremendous potential market offered by commercial wiring modernization.

Several devices or kits have been brought out to meet this need. All of these, of which the writer has knowledge, are neat little self-contained units using miniature lamps and resistances to simulate actual circuit conditions and no doubt serve the purpose for which they were designed.

It was felt, however, by the Pacific Coast Electrical Bureau, that a little different approach to the problem would give us the selling tool we need. Accordingly, the writer has designed and built a demonstration kit that does two important things:

First, the existing lighting installation is used in making the demonstration. Second, by means of an autotransformer, the voltage is boosted up to normal lamp rating. The accompanying photographs show the kit in portable form and how the laboratory is carried to the prospect's premises.

It is not uncommon to find a 5% voltage drop in office buildings and where this condition exists, a striking demonstration can be made showing the customers the light he is paying for and then by sudden contrast, what he is getting.

In a recent office building demonstration, it was shown that the owner was paying for 12 watts for each 200-watt lamp used and receiving not a single lumen of light in return. There were 1,000 two-hundred watt lamps in the building, which meant 12 kw of wasted energy by reason of lowered efficiency of the Mazda lamps because of low voltage from inadequate wiring.

This waste alone, to say nothing of the I^2R loss in the wiring, amounts to $50 a month or $600 per year. It is an inborn trait of the American people to get what they pay for or do something about it. When conditions were revealed to the owner of the building, he promptly decided to do some re-wiring. A few jobs like this will make the 40-lb. demonstration kit literally worth its weight in gold. This is not the only use for the kit.

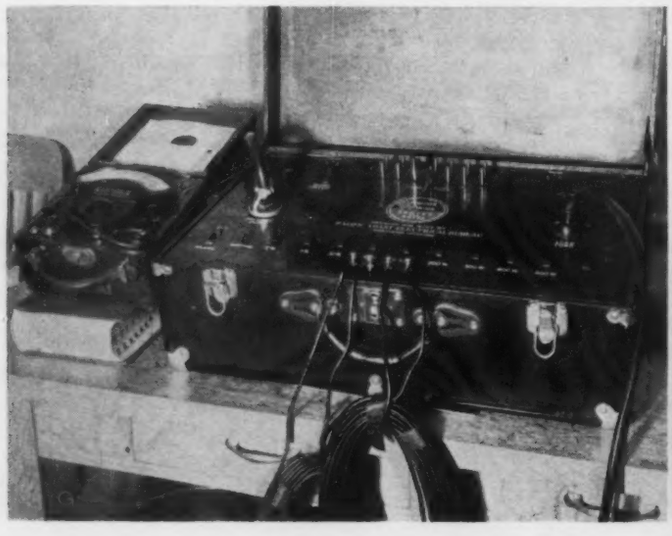
It is used in lecture and class work to show the effect of 2%, 5%, and 10% voltage drops. This is done with electric range element wire and test clips. The whole arrangement has been made sufficiently flexible so that this voltage range may be secured on any load from one 100-watt lamp to 5 kw. This is very important and makes possible controlling a large number of lamps in a department store, for instance such as in a bay.

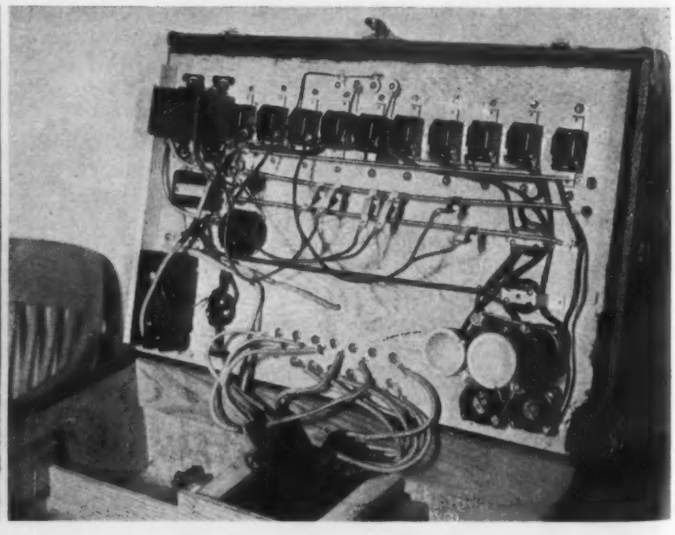
There are three other features of the kit. Two toggle switches are used to insert into the circuit either 100 ft. of No. 14 wire or 100 ft. of No. 12 wire. A few inches of resistance wire would have done the same thing, but we chose actually to use the wire for psychological reasons.

Four more toggle switches are used in conjunction with four 600-watt headlight heater elements to add to the circuit in amounts of 200 watts, 300 watts, 600 watts, 800 watts, 900 watts or 1,200 watts. This is important also because it can be used to show the proportionate loss in light that would result from increasing lamp size on existing wiring.

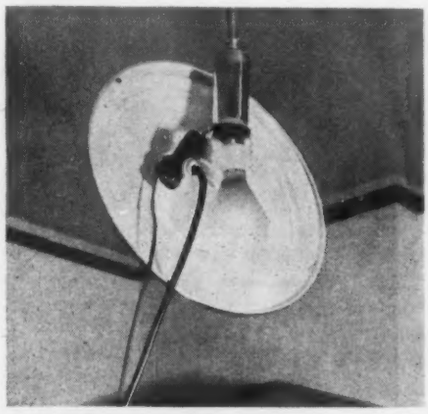
Lastly, a No-Fuse circuit breaker was introduced to show a modern protective equipment and how it operates.

Housed in a fiber suitcase, the testing kit weighs about 40 lb. Voltemeter is carried separate and packed in. Under panel (right) can be seen arrangement of switches, heater elements, etc.





For the benefit of those technically inclined, the accompanying schematic diagram will be of interest. A voltmeter and sightmeter are of course essential. For large groups, we use a projection sightmeter.

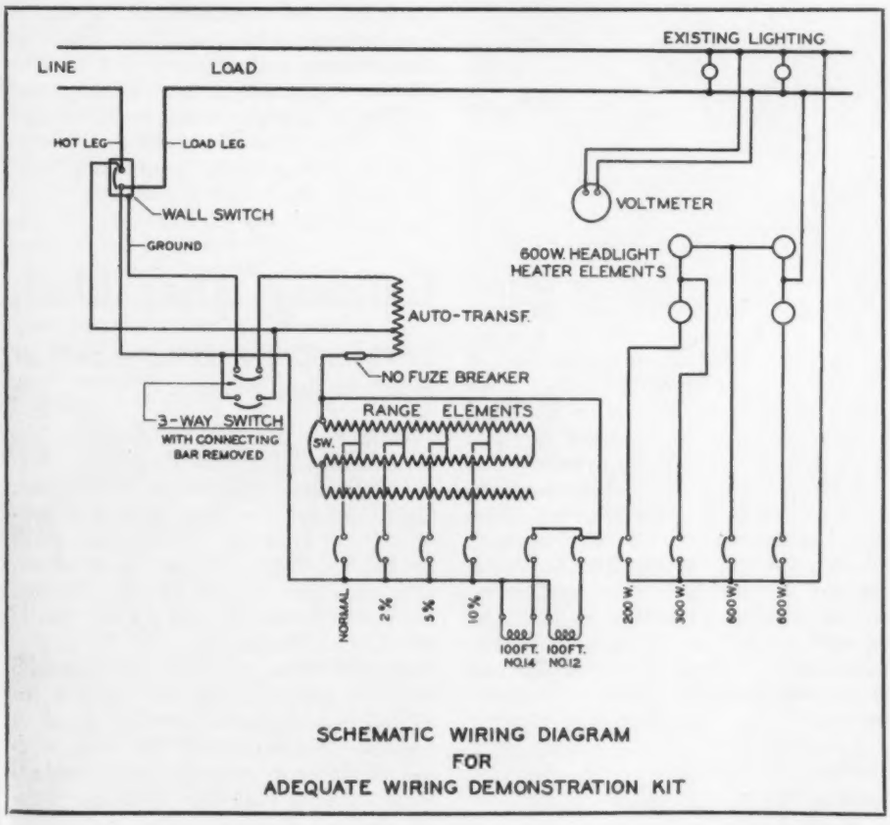


An adaptor is used to show effect of increasing lamp size without raising wiring capacity

The importance of using the auto transformer will be seen from the foregoing. For a time, while the equipment was set up in crude form, we used a Cutler-Hammer, 400-watt, auto transformer theatre dimmer. The tapped auto transformer used in the new portable kit is wound with No. 10 wire but if lesser load handling capacity were desired, there are several compact auto transformer units on the market, such as the "Variac" and "Vari-Tran" of 850-volt-ampere capacity. In addition, both Cutler-Hammer and Ward-Leonard make theatre dimmers in 1,000-watt sizes.

When the demonstration of this kit was made to the class of journeymen electricians at the local union in San Francisco, the wiremen were so enthusiastic that they halted the demonstration until they could get the building manager and make him see the lighting conditions in the hall they were renting from him. The effect produced when the voltage, raised to what it should be by means of the auto transformer, is dropped to what it actually was found to be, usually leaves the dealer very dissatisfied with his lighting and determined to do something about it.

● TO IMPROVE the famous view down the "narrowest city in the world," the Utah Power & Light Co. has begun extensive street lighting improvements in Bingham, Utah, home of the world's largest open cut copper mine. Object of the program, expected to cost $10,000, will be removal of extra wires leading to residences and business houses, use of cables wherever possible, and removal of lower arms on all light poles. Project will also include installation of the latest type street lights, placing of 45-foot poles in the business district and replacing numerous lead-in wires by single cables. Seventeen additional lights will be placed at extremely sharp curves to eliminate night traffic hazards.



SCHEMATIC WIRING DIAGRAM
FOR
ADEQUATE WIRING DEMONSTRATION KIT

Cartoon Display

Southern California league distributes illuminated panels

Illuminated cartoon display panels to the number of 20 will be placed in electrical contractor windows in Los Angeles and southern California as a means of advertising adequate wiring.

The Electrical Development League of southern California is making available to contractors 20 of these display panels, 18-in. wide, and 3 ft. high. Cartoons in the National Adequate Wiring Bureau material are enlarged, colored, and placed on translucent white paper between two sheets of glass, behind which are six 40 or 60 watt lamps in a light box, on flasher control.

ELECTRICAL DEVELOPMENT LEAGUE
"AND THIS HOUSE HAS LOTS OF PLACES TO PLUG IN LAMPS AND THINGS!"
FOR YOUR PROTECTION—INSIST ON
ADEQUATE WIRING
WHEN YOU BUILD OR BUY!

One of the new illuminated cartoon displays

On a celloglas panel at the bottom are the words, "For your protection insist on Adequate Wiring when you build or buy." The panels will be changed about once a month by inserting a new cartoon between the glass.

Side panels, on hinges, are blank, and furnish space for the dealer to tack literature or pictures of his own choosing. A slot at the top is made to hold a card with the contractor's own name and address.

● A SPECIAL COUNCIL COMMITTEE in Seattle is making a study of better night lighting for driving on main arterial highways and if found feasible will later consult with the State Highway Department in an effort to obtain state aid for installation of such lighting. Requests for more adequate lighting were made by 21 improvement clubs.

Putterers' Shop

Specializing in spare parts is costly but it pays

If a hardware store, with its thousands of items of hardware neatly fastened to the outside of drawers or bins is fascinating to any mechanically-minded man, it will be understood then why Morrison Electric Co. of Portland is a stimulating place to visit. It caters to that great tribe of "fixer-uppers" among Americans who like to putter with their own repair jobs. As an auxiliary service, but just as important, it does repair work for those who either fail to fix it themselves or who do not want to be bothered.

There is a definite technique in making such a business pay, according to Ray Parrott, its manager. First, the stock must be organized so that items may be found quickly; second, much of it must be visible so that the customer who doesn't know the name of the article can say, "give me one of those;" third, you must invest enough in it to carry an exceptionally complete variety; and fourth, you must get a profit because otherwise the infrequent turnover of some items will eat you out of house and home.

Morrison Electric Co. is well organized for such service. The accompanying illustrations give an idea of the neat and orderly arrangement and the visibility of much of the stock. In the upper picture behind the counter is Ray Parrott waiting on a repair customer. He always wears a clean smock in keeping with the cleanliness and orderliness of the entire store. In the stock room behind him may be seen the rows of bins in which literally thousands of repair parts for appliances are stocked. An index system furnishes immediate reference to the bin in which it is to be found.

In the forepart of the store the kind of electrical fittings and parts that customers are likely to want are stocked. As in a hardware store the outside of the bin or drawer has affixed to it securely samples of what is to be found inside. Name of the item and its price is on a little card on the drawer.

With the same psychology working for it as in a dime store, Morrison Electric has its floor well covered with tables on which wiring fittings, fuses, etc. are displayed. Table appliances, clocks, lamps and the like are displayed on open shelves or tables so that those who come in the store may handle and examine and play with them. They sell very well that way, Parrott finds.

Two wide windows are mighty effective ads for the store and its services. Ordinarily wiring materials are not something with much apparent eye appeal, but in the bottom picture notice how Parrott has arranged them in symmetrical patterns and placarded them to suggest wiring and rewiring. A good volume of rewiring and wiring business is carried on by this company, much of it finding its way to the shop because of suggestive window displays.

Lots of stores sell floor and table lamps, but where can a person find new bowls to replace broken ones, switches or parts? One wing of the L-shaped window usually displays lamps and just such spare parts. Cards in the window often suggest the converting of old lamps into new types or similar ideas.

"Yes," says Ray Parrott, "it takes quite an investment to run this kind of business, and wise buying and careful records. We have been accumulating parts for appliances for many years and I daresay we have parts for some that can't be found anywhere else. But we have become known as the place to come to when all other sources fail, and that in itself has meant a good deal of business to us."

AW Standards

Los Angeles adequate wiring to conform with new code

Adequate wiring certification standards are being revised in Los Angeles to conform more closely with the new code and Los Angeles ordinance. Services will be computed on a square footage basis rather than a set minimum. For instance, house of 800 sq. ft. or less will have a minimum service equipment of 70 amp. in order to certify. From 800 to 1,600 sq. ft. will require a 90-amp. service, 1,600 to 2,200 a 100-amp. and for larger than 2,200 as required by the circuiting and load.

Building After Dark

Southern California home built at night to lure prospects

Unique in building circles was the construction of a new all-electric, five-room demonstration home in Whittier, Calif. at night, so that interested persons could view the construction. Built by Hughes Bros., Whittier contractors, and dedicated to Thomas A. Edison, the model home was opened for public inspection Jan. 1.

Hughes Bros. noted that people who were in the market for $6,000 to $9,000 homes usually were confined to business duties during the day, with the result that evenings, and Sundays were the only time they could go shop-

ping for a home.

By showing the public at the flood-lighting location the operations which go into the building of a home, prospective buyers could personally see the hidden values of excellent construction methods and materials.

Extensive advantage of electricity's modern services is taken throughout the home. All rooms are heated by fan-type modern electric heaters built into the wall, which at the flip of a switch, flood the room with clean, healthful warmth. The bathroom heater is a "head to heels" type especially designed for this purpose.

The kitchen includes a new electric range with electric room heater built into drawer space. A 40-gal. electric water heater and an electric refrigerator complete the roster of the home's electrical servants. Total connected load for cooking, water heating and space heating is 35.6 kw.

A weekly broadcast from the home stresses such other advantages of this home as the number of convenient outlets, the supplementary fluorescent lighting system in the living and dining rooms and the excellent outdoor lighting facilities.

Yakima Exhibit

Pacific Power & Light put power pole on display

Just how much investment is tied up in the distribution system was dramatically demonstrated at the Yakima fair in southeastern Washington, when Pacific Power and Light Co. used a power pole itself as part of their exhibit. The top of the pole was brought down to where it could be examined, and the nature and cost of its various components were described.

Charts identifying the parts listed 79 items, costing $126.58. Additional labor costs were also shown. Streamers from the chart to the actual piece of equipment enabled visitors to identify unfamiliar devices.

Worked out as part of the company's "Electricity is Cheap" exhibit, the pole was on display to some 85,000 visitors.

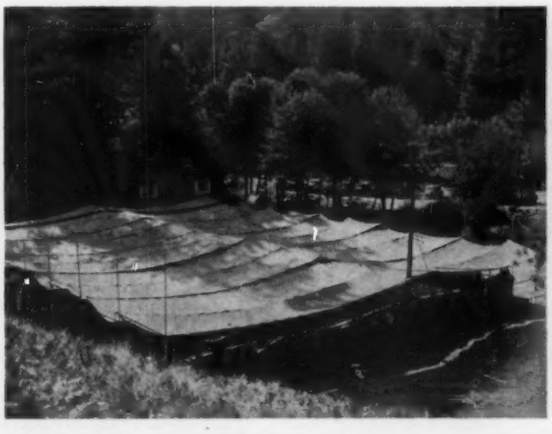
● INDIAN TEPEES, too, are in the incipient stage of the "Comfort and Convenience with Electricity" trend. The village of Papago Indians, near Phoenix, Ariz., is now equipped with the latest electric lighting, together with many appliances including electric ranges. Motion picture equipment has been installed in a public building so that the villagers may be critics to the latest "Mickey Mouse."

Ice Skating a La Carte At Arrowhead

ICE skating is where you find it these days—beneath palm trees in southern California sunshine, in indoor auditoriums or on the stage at your favorite theater or night club.

The Blue Jay Ice Rink near Lake Arrowhead in the San Bernardino mountains is a new addition to southern California's growing list of ice rinks. Electricity is the background for its operation.

Connected load includes one 75 hp. motor (50 hp. demand) operating a 9 x 18 Vilter compressor, one 50 hp. motor operating a 7½ x 7½ York compressor, one 50 hp. motor operating a 7½ x 7½ Vilter compressor, one 40 hp. motor operating a 7½ x 7½ Lipman compressor, one 15 hp. motor operating brine circulating pump, one 10 hp. operating brine circulating pump, one 10 hp. motor operating condenser water pump, one 5 hp. motor operating condenser water pump, one 3 hp. motor operating agitator in the brine tank.



Canvas stripping protects skaters and ice from a broiling sun in southern California. At right, a former state champion twirls on the one-inch thick ice, made with the aid of electricity

The average compressor discharge is 150 lb. per sq. inch. The average compressor suction is 25 to 28 lb. per sq. inch. Cooling water is pumped from an open mountain creek at 45 deg. F. and is returned through a spray system back into the creek at approximately 60 deg. F. The average brine temperature is 10 deg. with a 2 deg. variation upon entering and discharging from the rink floor coils. The refrigerant is ammonia and 125 tons of refrigeration cover the 7700 sq. ft. of floor space.

General running time starts the plant at 6 a.m. with the 75, 50 and 40 hp. compressors running to 4 p.m. At this time the 75 hp. compressor is shut off and the 50 and 40 hp. compressors operate to 2 a.m. The condenser water pump motor, of course, operates all the time.

The basic principle of the Blue Jay Rink is unusual as compared to other rinks in the United States, due to the fact that oval coils are installed throughout the floor, and with the principle of counter flow of brine the floor is of practically uniform temperature over the entire area. Approximately ten miles of pipe are in this system, with a floor storage of brine of 10,000 gallons and brine tank shortage of 40,000 gallons. The floor temperature is 31 deg. F. and four feet above the floor the temperature has gone as high as 87 deg. F. The average mean temperature has been 87 deg., with a high temperature of 96 deg. taken under the canvas which protects the ice from the sun.

Following each of the three skating sessions held each day, the ice is scraped and sprinkled with 130 deg. water. Following application of the hot water, the one inch of ice is ready for skating 15 minutes later.

W. R. Barkus of Alpine was the electrical contractor. Fred Esser of Wilmington was the refrigeration engineer. Esser states that the York Ice Machine Co., York, Pa., have two engineers who have been studying conditions at all ice skating rinks in the country, and they claim that conditions regarding ice temperatures and humidity at the Blue Jay Ice Rink are unexcelled anywhere in the United States.

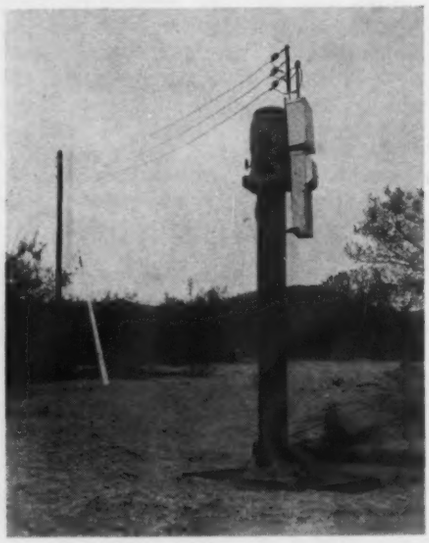
Mount the Pumps

By raising location of pumping equipment in dry stream beds, serious flood damage is licked

DRY stream and river beds of the southeastern part of the U.S. are the objects of considerable factious comment on the part of Easterners. Although there is no water in sight in these channels during most of the year, in the rainy season these same water courses present an entirely different appearance. This is particularly true if an unusual amount of precipitation has occurred, and flood conditions prevail. These stream beds are then filled with raging torrents which over-flow the banks and sweep an immense amount of debris along with the flood waters.

The location of wells where a sufficient flow of water can be secured, is a serious problem in the arid sections of the country. In such cases the stream bed becomes an ideal place to locate the pump, from the viewpoint of securing an adequate volume of water, for in many instances there is an underground flow fairly close to the surface. However, there is extreme difficulty experienced in maintaining the pumping plant at such locations without injury during the period of high water.

Serious damage is entailed by water-soaked motors, washed out pumps and ruined wells. In many instances the entire installation above ground is washed downstream and buried in sand so deep that it is never recovered. Some farmers solve this difficulty by removing their pumping equipment each year



This rigid column pipe stands with its protected pump equipment ready for the deluge

prior to the rainy season. This procedure involves considerable labor and, in many instances, is not feasible for the reason that it is necessary to do a certain amount of pumping during the months when high water might be expected.

Eugene Bressel, a southern California pumping engineer, has solved the problem by mounting the pumping installation ten feet above the river bed. The plant consists of a turbine pump, motor, electric panel and meter housed in one compact weather-proof unit. The pump remains in place and, if desired, can be operated even during flood period. It is apparent that such an installation must be very carefully designed if it is to withstand the tremendous pressure which the swirling water will exert to carry it away. The essential requirements are as follows:

(1) The foundation should be deep enough so that the water will not erode the sand away from underneath it.

(2) The design of the fonndation should be such that it offers as little resistance to the water currents as possible.

(3) The column pipe should be very rigid for this will not only be called upon to withstand the pressure of the water itself, but it will also catch considerable debris which has been carried downstream by the swirling water. The trees, brush, driftwood, etc., will be caught by the column and form an island upon which the water will exert great pressure.

Erosion Effect

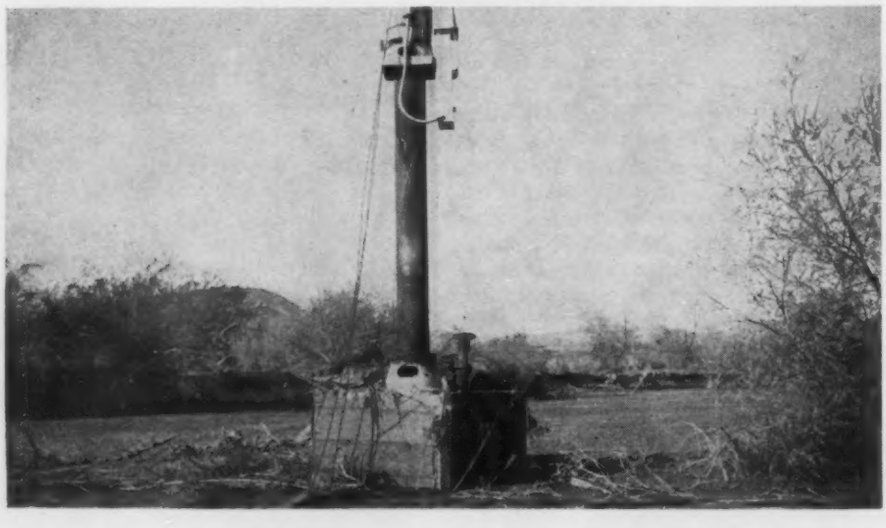
The two pictures show one of these pumping installations "before and after" the serious flood which occurred last spring. The erosive effect of the flood water is indicated in the bottom picture, which shows that about three ft. of the sand at the base of the pump had been carried away. The service pole, which was located about 100 ft. from the pump is not shown in the picture, for it had been washed away. However, the pumping installation located in the midst of the stream itself, readily withstood the pressure which bore down upon it.

Diamond Shape Support

The picture shows a 30 hp. motor-driven pump of 225 gal. per min. capacity. The concrete foundation supporting the equipment is diamond shape with the lond ends pointing up and down stream, and is eight ft. long, four ft. wide and six ft. deep. It is designed to set up circular water currents that have a tendency to carry off the debris which lodge against it. The ten foot length of twelve in. extra-heavy column pipe is strong enough to withstand the heavy pressure exerted upon it. In those cases where the pump casing is not of sufficient size, a larger casing is placed outside it and cement is poured between the two pipes.

It would seem from the short experimental period to date that this type of installation is sound for all six other similar jobs survived the serious spring floods without damage.

Diamond-shaped concrete foundation here has been bared by powerful erosive flood waters



Rural Research

U. S. Dept. of Agriculture conducts program for REA

How the U. S. Department of Agriculture is conducting research in rural electrification is described in a recent letter from Harry L. Garver, agricultural engineer for the Bureau of Agricultural Chemistry and Engineering in Washington, D. C. Garver, who was formerly in the agricultural engineering department of Washington State College and active on the Washington CREA, has been in the national capital since last November.

Because the REA has no funds for research, this work is done by the bureau to which Garver is attached. Many of the projects are conducted in the same fashion as in the colleges and universities of the Far West. Cooperative agreements for research are in effect with Virginia Polytechnic Institute, Purdue University, University of Nebraska and University of Georgia.

"Objective of our research program," Garver writes, "is that of finding uses or methods by which electricity may be used on the comparatively low income farms in such a way as to pay its own costs. Our problem does not concern itself so much with the means by which electricity is brought to the farm, but rather with the farm itself. We are tryig to attack this problem from the farmer's point of view, but, of course, realize that changes in his program may be necessary as well as changes in his equipment if he is going to make electricity profitable for him. And unless we can make it profitable for him, there are many farmers who cannot afford to use electricity even if it will afford him many social advantages that he does not now have."

CREA '40 Program

Rural electric fellowship established at Univ. of California

Included in the 1940 budget of the California Committee on the Relation of Electricity to Agriculture is a one-year fellowship in rural electrification at the Univ. of California. Other recommendations listed at a recent meeting of the committee, which are aimed at increasing the profitable use of electricity in California agriculture, are the following studies.

Dairy Sterilizer—the conduct of field observations of farm installations to supplement laboratory studies; Air-Conditioned Greenhouses—to continue studies and observations in this newly developed field; Dehydration—to perfect a low-cost unit for use on individual farms and to operate it during the 1940 harvest season; Egg Cooling—to continue studies on an electrically operated egg cooler; Control of Insects with Light—to publish an agricultural experiment station bulletin on field applications.

Other subjects to be studied are Feed Grinding and Mixing; Ultra Violet Light in Cold Storage Rooms; Soil Sterilizer; Overhead Sprinkler Irrigation; Poultry Operating Cost Data; and a Rural Electric Short Course, which will be conducted for rural power salesmen for the purpose of acquainting them with the latest developments in the field of rural electrification.

For the accomplishment of this program, the CREA budget committee has urged the appropriation of $2.00 per quarter or a total of $8,000 in 1940. Assistance of 25 to 40 county farm advisors will be utilized and 50 farmers will cooperate by permitting tests and studies to be made on their farms.

● AGRICULTURAL POWER experts of power companies, manufacturers and other agencies will be afforded specialized instruction in the latest applications of electricity to agriculture at the Rural Electric Conference to be held at the Univ. of California, College of Agriculture at Davis, Jan. 15-17, 1940. This is the regular annual course of instruction sponsored by the California CREA.

● LEGISLATION may be necessary to give Idaho public utilities commission regulatory power over electric fences. This was forthcoming after a conference of state leaders on the possibilities of controlling a menace which has caused the deaths of several persons during the past year from electrocution. William L. Cone, representative of the Utah Power & Light Co. advocates an educational program to make farmers realize the deadliness of the fences. Makeshift arrangements for charging barricades with electricity have caused most of the deaths.

● CALIFORNIA AND UTAH rank with Rhode Island in having the greatest percentage of farms in the U. S. electrified at the end of last year, with the number of electrified farms still increasing, according to latest figures. At the close of 1938, 19,179 of the 21,342 farms valued at more than $500 in Utah were receiving electric service for a percentage of 89.8. In the Utah Power & Light Company territory, nearly 99 per cent of the farms are electrified, company officials declare.

Potato Cooker

Low-cost device developed by Utah Power & Light

Rural customers served by the Utah Power & Light Co. have been saving money by the development of an extremely low-cost device for cooking potato culls which are used for hog feed. These culls must be cooked to make effective hog feed, but naturally the process must be inexpensive.

The Utah cooker is made by taking a 40-gal. range boiler, cutting out the bottom and using this open end as a top. A ¾-in. rim is left to accommodate a rubber gasket, and an old plow disc is used as a lid. A couple of fittings are welded to the tank at the top to provide for a hinged bar which is used to clamp on the lid. The lid is equipped with a safety valve.

Rural customers of Utah Power are highly pleased with the results of this 40-gal. range boiler, which has been converted into a potato cooker. An old plow disk serves as lid

Strip heaters are wrapped around the tank near the bottom, providing about 3-kw. capacity. The whole device is covered with insulation and mounted on trunnions, the latter so it can be upended to dump a batch.

The tank is filled with potatoes, and just enough water is added to cover the area where the heat elements are clamped on. Pressure rises to 7 or 8 lb. per sq. in. during cooking, and the upper potatoes are cooked by steam. It takes about 4 hr. to cook a 40-gal batch, and energy consumption amounts to 11 or 12 kw.-hr.

Besides being an excellent way to introduce electricity usage to the farm, salesmen find that customers like the equipment because it is trouble free, cheaper and safer than wood or coal. In cold weather, the fact that the cooker can be safely operated indoors makes for savings by forestalling loss of feed through freezing.

ELECTRICAL WEST

The All-Industry Magazine of Progress

Established 1887 and Incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity"

McGRAW-HILL COMPANY OF CALIFORNIA
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1940—A Good Year

PROPHECIES have a way of coming back to haunt a prophet. Even so, here is a prophesy on which ELECTRICAL WEST will stand: 1940 will be a good year for the electrical industry. Complex as the future outlook may be as regards national elections, war or peace, labor strife or power politics, there are fundamental factors which lead to such a conclusion. Power production is topping all previous peaks. New building is holding up and a wave of building modernization has set in. Appliance sales are climbing and new models will further stimulate public purchasing. The public attitude toward utilities is more favorable. Finally the people in the electrical industry are stalwarts who have been toughened by adversity and tested by past storms. It is mainly because of this group of strong men and women whose energies have given the industry its purpose and achievements that we repeat with confidence: 1940 will be a good year for the electrical industry.

Thin Wall Approved

COMMERCIAL and industrial wiring modernization should proceed with speed now. If the reasoning of those who have supported the idea of thinner insulating compounds as the hurdle to one of rewiring's toughest obstacles is right, then the action of the Electrical Committee, NFPA, in revising the National Electrical Code last month, will open the way to a real drive for adequate rewiring.

Approved also were increased conduit fill for rewiring, using the new thin wall insulation wires of larger copper carrying capacity, as well as a new table of current carrying capacities for grades of wire above the old "code" grade. Thus the Electrical Committee has recognized progress in the improvement of rubber compounds and synthetics.

Although bare neutral and covered neutral were not approved there seems to be less need indicated for them with these provisions for greater conduit fill and larger wires. At long last wooden mouldings and cast-in raceways, not used in years and for which fittings long ago ceased to be made, were eliminated from the code.

On the whole these reported code changes for 1940 seem to indicate good sense and balanced judgment, avoiding the pet panaceas of zealots in any camp.

Bonneville's Future

IS THE Bonneville situation as it affects the future of the utilities in the Pacific Northwest amenable to clear appraisal at this time? Elsewhere in this issue is an interview with Dr. Paul J. Raver, the affable and engagingly frank administrator, who today dictates the policies of the Bonneville Power Administration. This resume of policies and progress is as significant for what it does not say as for what it does. Many of the vital issues are left undefined and vital questions left unanswered, at least publicly. It is regrettable that political expediency and political diplomacy make such a course necessary.

Briefly here are some facts Dr. Raver brings out: The Bonneville Administration has been reorganized, with emphasis placed on power marketing and utilization. The $59,000,000 dam and power house (only $11,682,000 is allocated to power generation) today has one major energy-consuming customer, the Portland General Electric Co., which is taking upwards of three times its contract demand. Contracts for minor blocks of energy have been signed with a number of PUD's, none of which are functioning. The first major industrial contract has been signed with the Aluminum Co. of America for 32,500 kw. initially for an industrial development that ultimately may rival the company's Alcoa, Tenn., plant. While re-sale rates have been established and written into one contract with a small municipal utility system, the final policies have not been crystallized. An initial section of the $27,000,000 Bonneville transmission system has been energized. Addi-

tional money will be spent for transmission facilities although a more liberal attitude toward interconnection with other systems is in prospect. Assistance is being given already organized PUD's in an endeavor to get them functioning, but Dr. Raver denies that the Bonneville staff is fostering or promoting new districts.

The fact that Congress convenes in January undoubtedly has a distinct bearing on the points enumerated above. The Bonneville project must make a substantial showing if its request for additional appropriations is to be received sympathetically. The Congressional "power bloc" must also be impressed. Furthermore there are the 1940 elections in the offing. These, in a measure, explain some of the latest tactical moves.

However, there are several points on which the public and the utilities need enlightenment. And only Dr. Raver can supply the information. For instance, is there to be a repetition of the TVA grab in the Northwest? Are the properties of the investor-owned utilities to be gutted by chopping off pieces willy-nilly for the different PUD's? Is the government, through RFC or some other federal agency, going to finance the PUD's now that they find that their proposed revenue bonds are unmarketable? Will Bonneville compete for industrial business in territory already served by the private companies? Why have Seattle, Tacoma and Eugene with their municipal systems refused to deal with Bonneville? Would not more good accrue to the whole Northwest if Bonneville's low-cost power was used primarily to attract new industries such as the Aluminum Company rather than as a spur to government ownership? Is it the intent to superimpose federal rate regulation on the state regulation which has so effectively given the public low rates in that region?

Until such questions as these and a lot more are answered, it is impossible to predict how the Bonneville project ultimately will affect the electrical industry in the Northwest. Perhaps in the near future Dr. Raver will answer them for publication.

Contractors' Indictment

EXACTLY one week before Christmas electrical contractors of San Francisco and Oakland were handed a package of far from holiday felicity. A federal grand jury had returned indictments against them for violations, it was said, of the anti-trust act. The remainder of the week they spent posting bail, being fingerprinted, consulting attorneys — scarcely preparation for a happy Christmas. The stigma of indictment, even though they may later be found innocent, was laid upon them.

Not the gyp contractors, the cut-price, ethics-be-damned kind, in many cases the real criminals against their customers and their craft, were named. No, it was the contractor who has given unselfishly of time, energy and money to serve his industry as an officer or committeeman, as a cooperator with other branches of the industry, as a patient and long-suffering worker for the betterment of contracting. As an officer of the association, he was asked to take this rap too.

In an address to a convention in San Francisco May 22, Thurman Arnold, assistant attorney general of the U. S. gave warning in a talk, "What can business expect?" It contains also a suggestion as to a remedy for procedures of this kind. Said he:

"I recognize that the criminal indictment is a clumsy instrument because it makes an economic offense appear as a moral one. I would prefer that the teeth be put into civil remedy. I have drawn up legislation designed to that end. Until such legislation is passed, however, I shall use the criminal penalty, not because I want to make faces but because it is the only method Congress has prescribed for putting a hazard in the way of combinations in restraint of trade. My suggestion to those who dislike the indictment process is that they urge Congress to provide a different procedure instead of blaming the referee for enforcing the rules which he has taken an oath to follow.

"The civil procedure deals with the future. By means of a civil decree business men can be required to give up practices in restraint of trade and at the same time can get judicial approval of combinations or concerted action which may be justified within the rule of reason."

While such a statement takes some of the sting from the indictment and suggests a way in which business may seek to revise the anti-trust law, it still does not account for the basic charge against these contractors. And similar complaints will be made against other contractors throughout the nation in the present drive on the construction industry. Specifically they are charged with interfering with the flow of interstate commerce, the only accusation in which there could be federal jurisdiction.

To anyone familiar with the care with which these associations have proceeded legally to conform to the state laws and the previous interpretations of the federal laws, these indictments imply far-reaching consequences. Contracting is certainly a local and hence an intra-state class of business. The NRA itself was declared unconstitutional unanimously by liberal and conservative justices of the U. S. Supreme Court alike because it extended federal jurisdiction over purely intra-state activities.

The issue here, then, is much deeper than what happens to electrical contractors. If the case against them holds, then federal jurisdiction extends into every local business, and state laws, even states themselves become impotent and may as well resign all powers to a centralized government. The issue is that grave.

Indictment

San Francisco bay contractors are first anti-trust cases

What Thurman Arnold, assistant attorney general of the U. S. called "a clumsy instrument (the criminal indictment) because it makes an economic offense appear as a moral one" was invoked first on the electrical contractors associations and their officers in the San Francisco and Oakland areas in the federal administration's drive on the construction industry. After weeks of questioning a federal grand jury in San Francisco indicted the two associations, two locals of the electrical workers union, and 36 individuals, all of whom were officers or committeemen in either the associations or the unions. Where individuals were officers of their own corporations the corporation was also indicted.

Charges specifically boil down to alleged violation of the Sherman anti-trust act—"have formed and carried out in the San Francisco bay area . . . a wrongful and unlawful combination and conspiracy in restraint of interstate commerce in electrical equipment in violation of . . ." the anti-trust act. The "conspiracy" is elaborated upon as one of regulating, fixing, dictating and controlling bids, which are claimed to have "thus unreasonably and unlawfully restricted the amount and volume of electrical equipment shipped into the area in interstate commerce."

Indictments were returned Dec. 18, and within that week similar indictments were made of the hardwood flooring and plastering groups and more are promised as the investigators continue. Such investigations are also being made in Los Angeles, Portland and Seattle, as well as in many eastern cities as part of a nationwide anti-trust drive on the construction industry. Strongly organized under the A. F. of L., construction union leaders maintain that the drive is politically inspired to make a break in the construction industry so that CIO organization can be introduced.

An interesting angle to the case is that D. W. Tracy, president of International Brotherhood of Electrical Workers, Washington, D. C., and W. A. Kelly, international vice president, are also named in the indictment as well as the officers of the two locals, No. 6 and 595 of San Francisco and Alameda Counties, respectively.

Organized and incorporated under the laws of California, which are more liberal than the federal laws (recognizing the need for association control in the marketing of its fruit crops) both associations maintain they operate wholly in intra-state business and that the federal charge is without jurisdiction. Also they maintain that the bid depository, far from being an instrument to aid collusive bidding, is prevented from being so by its by-laws and independent operation and instead is a medium to restrain unethical bid-shopping and vicious price cutting and specifically to uphold the state statutes prohibiting selling below cost.

On Jan. 3, dates for trial were to be set, all individuals and associations having posted bail. Attorney for the contractors is Walter J. Walsh; for the unions, McKenzie & McKenzie. Defense will be made along the lines that the associations and officers were operating under permissive laws of the state of California and that the federal statutes are without jurisdiction because any electrical materials involved have become comingled with the property within the state and are no longer in interstate commerce. A far-reaching principal of states' rights is considered to be involved in this case by the attorneys and the case is destined to become an important test of federal jurisdiction.

Appointee

Kempston named new staff member of southern California League

Arthur Kempston has been added to the staff of the Electrical Development League of southern California, according to F. L. Hockensmith, general manager, for work among contractors and inspectors in the territory of the Southern California Edison Co. Kempston, at one time chief electrical inspector in San Francisco, is one of the best informed men on codes and wiring methods in the state. Until recently he was promotional representative in the west for National Electric Products Co. and was one of the committee of three which rewrote and revised the Los Angeles electrical ordinance on behalf of the League.

An experiment will soon be tried in the Edison territory under Kempston's direction. Broadsides will be mailed to the utility's customers in certain districts, with an accompanying return postcard. Prospects developed by this procedure will be turned over to electrical contractors to be followed up and sold, with help and advice from Kempston as a preliminary training to such selling activity.

More uniformity in the 70 or more local ordinances in southern California will be Kempston's ultimate aim.

Agenda

Associations gather in important western electrical centers

Christmas parties, shows and regular luncheons constituted last month's club activities. Looking into the new year, one finds programs again under way with vigor and vim—serious discussion of electrical activities and trends.

The Air Conditioning Society, San Francisco—Met Nov. 30 at Bellevue Hotel to hear Frank Hutchinson of Univ. of Calif. speak on "Panel Heating." Hutchinson, who had toured Europe recently, told of panel heating and panel cooling in England, France and the Scandinavian countries. James R. Hedge is secretary of the Society.

Electric Club of San Diego—Met Dec. 12 at U. S. Grant Hotel to hear Robert Richardson, professor at San Diego State College. "Racial Elements in the United States," was his interesting and timely topic." Chairman of the day was M. E. Musgrave.

IES—San Francisco Bay Cities Section—Met Dec. 8 at Aquatic Park Pavilion Blue Room for dinner. Speaker was W. C. McHenry, manager, Sterilamp sales, Westinghouse Lamp Division. He spoke of future possibilities of Sterilamps in the home, gave practical demonstrations of effects with micro set, commercial setups, and Sterilamps in actual operation. Dr. Leland Brown notified the members that Jan. 15 was deadline for outlines of papers for the next annual IES convention. John D. Erikson is secretary. Robert Dearborn was chairman of the evening.

IES—Southern California Section—Met Dec. 12 at Eaton's Chicken House, Los Angeles, for dinner. Speakers were Gene Burke, Burke & Kober, whose subject was "Light in Merchandising," and Alston Rodgers, General Electric, who discussed "Lighting at New York's Fair." Francis M. Falge headed the Study Club, the subject being "Engineering Aspects of Fluorescent Lighting."

Electric Club of Washington—Met Dec. 4 at Arctic Club at weekly Monday luncheon. Ross Williams, assistant vice-president of University National Bank, spoke on "Federal Housing Administration Loans." Luncheon on Dec. 11 devoted to subject "What Factors Affect Climate and the Weather" as presented by Phil E. Church, assistant professor of geography at the Univ. of Washington. Annual Christmas party held Dec. 18 at evening dinner.

IAEI—southern California chapter—Met in Torrance, Calif. to discuss "Inspector Problems." Next meeting scheduled for Jan. 17, at Santa Ana city hall. W. O. Packard, city electrician of Santa Ana was elected chairman for 1940, Herbert Ufer re-elected secretary-treasurer. Thin wall insulation will be discussed at the next meeting. The standardized service idea was discussed and demonstrated by C. A. Rowley at the December meeting. Arthur Kempston explained the Electrical Development League's rewiring program soon to be undertaken.

NECA, Santa Barbara chapter—Business meeting was held Dec. 14, with dinner Dec. 28. Business meeting set for Jan. 11, with dinner gathering Jan. 25. Arrangements are being completed for joint meeting with journeymen.

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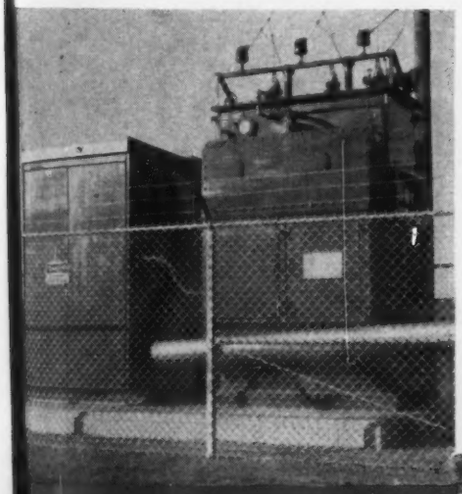
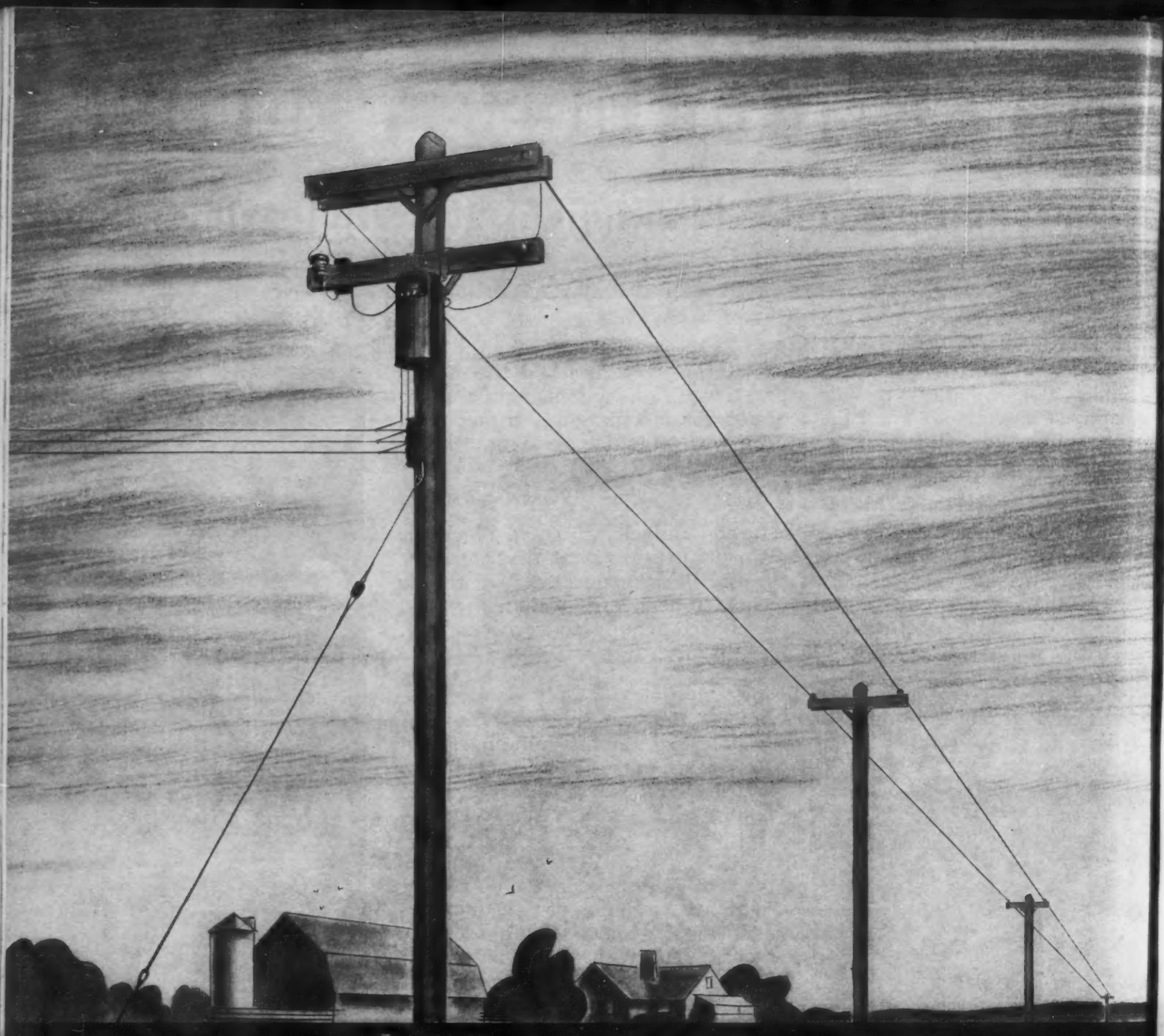


Like the larger G-E unit substations, this single-circuit unit substation offers economies in time and over-all costs. This unit includes: a three-phase transformer with automatic voltage-changing equipment; a low-voltage automatic reclosing circuit breaker with isolating and by-pass disconnecting switches; lightning arresters; and metering equipment

Attractive appearance is *another* feature of G-E unit substations. This typical substation is rated 3,000 kva, with breakers for both 13,200 volts and 4,000 volts. It is in service on the lines of the Public Service Company of Oklahoma, at Tulsa

GENERAL ELECTRIC

310-33



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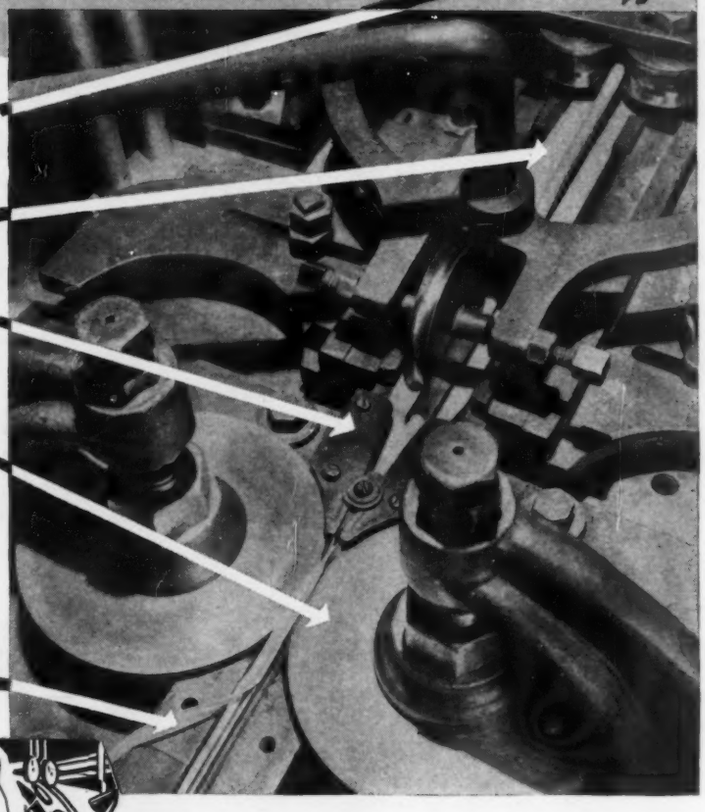


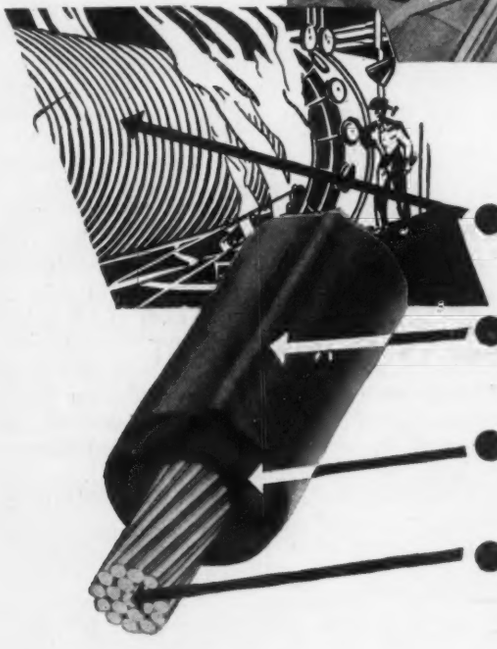
One or more similar machines applying inner strips of rubber insulation.

Final strip backed with sheet tin in position to form outer layer.

Shoe for forming and guiding final tin-backed strip about partially covered conductor.

Wheels compressing all layers into a solid, perfectly rounded mass. These wheels also lock final strip about conductor, thus forming the sheet tin backing into a continuous metal mold, which is removed after vulcanization.

Removing excess rubber but leaving familiar Okonite ridge.



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NEWS OF THE INDUSTRY

PUD COMMISSIONERS SWEEP WASHINGTON ELECTIONS

A victory for public power was scored by Washington public utility districts on Dec. 2d when PUD commissioners in all but two of twenty-five counties in the state were elected.

Despite the opposition of newspapers, taxpayers' leagues, private power companies, and kindred interests, the voters gave almost unanimous endorsement to present policies of the PUDS, judging from the election results.

The two exceptions were Chelan and Whatcom Counties. In Chelan County, the incumbent commissioners, Charles F. Kaiser, prominent Granger, was defeated by Paul Atwood, by a vote of 2,518 to 1,584. In Whatcom County, A. J. Friese, incumbent and president of the state association of PUD commissioners, was defeated by Conrad E. Barker of Bellingham. The unofficial vote in Whatcom County was 6,023 to 4,759. Barker advertised extensively his slogan of "No condemnation or bond issues without a vote of the people."

In Douglas County, Chester A. Bundy, Granger, incumbent, was re-elected on a platform of "immediate acquisition," while Thurston County retained George Marshall, incumbent, over J. C. Richardson, who ran on a platform calling for an election on condemnation of the Puget Sound Power & Light Co.'s properties, and issuance of bonds to pay for the purchase.

WWP RURAL CONSTRUCTION BUDGET PARTIALLY ABONDONED

Washington Water Power Co.'s $1,000,000 rural line construction program, announced in October, has been partially abandoned, according to the company's 1940 budget.

"The sudden increased activity and broadening of the scope of the rural electrification administration in this area has left us very few of the line extensions on which we planned," President Kinsey M. Robinson stated.

"We will continue to make small additions to our rural lines throughout the year, but big construction has been taken over by REA cooperatives."

Budget for 1940 is estimated at $1,600,000, of which approximately $1,400,000 will be spent on construction of facilities and distribution systems in towns served by the company in eastern Washington and northern Idaho.

DARK "DIVES"

How much light is enough—in a "joint?" That's the delicate question that puzzled San Diego police, who did not feel competent to judge without expert guidance and the use of sensitive instruments. An old law in the San Diego books declares that in places of public assembly there must be sufficient light to see what is going on.

When the vice squad raided a "joint" one night recently, they found it very, very dark. And things were going on in the dark that were very, very much against the law. A. L. Benedict, illuminating engineer, San Diego Consolidated Gas & Electric Co., was called in. And armed with a compound supersensitive lightmeter, and backed by a platoon of cops, Benedict is now determining what is enough light in many of San Diego's "dives." Nice night work, if you can take it.

Announcement of the proposed rural line expansion by Washington Water Power had brought an attack on the company by Harry Slattery, new REA administrator, who charged that REA co-ops were being encroached upon, and that it was an attempt "to wreck the whole REA program in the Inland Empire."

GOVERNMENT CARRIES HETCH HETCHY TO SUPREME COURT

A historic case against the city and county of San Francisco to prevent sale of power generated by the Hetch Hetcy plant to the Pacific Gas and Electric Co. last month was carried to the Supreme Court by the U. S. government. In its brief, the government charges San Francisco interests have "frustrated a plainly expressed congressional purpose to protect national parks against private exploitation."

City Attorney O'Toole had 25 days in which to file the defense brief. Government attorneys told the Supreme Court that "Congress, in granting rights to use lands in the national parks for the production of power, determined that this policy could best be attained by preventing private agencies from acquiring any right to sell energy produced through the granted use of public lands."

PORTLAND G-E REDUCTIONS DECLARED BY AUTHORITIES

A rate reduction promised by Portland General Electric Co., Portland, in the event that company concluded a contract for the purchase of Bonneville power, was made Dec. 15. At the same time Northwestern Electric Co. concurred by filing the same tariff to affect its customers in Oregon. The reduction affects 155,000 residential customers, totalling $700,000 annually, and took effect Jan. 1.

The new domestic tariff, which will save customers from 9% to 30%, was arrived at by conference between the two companies and Ormond R. Bean, Public Utilities Commissioner for Oregon. Bean stated his department would lose no time in analyzing the rates submitted, and until this analysis was completed, he preferred not to comment.

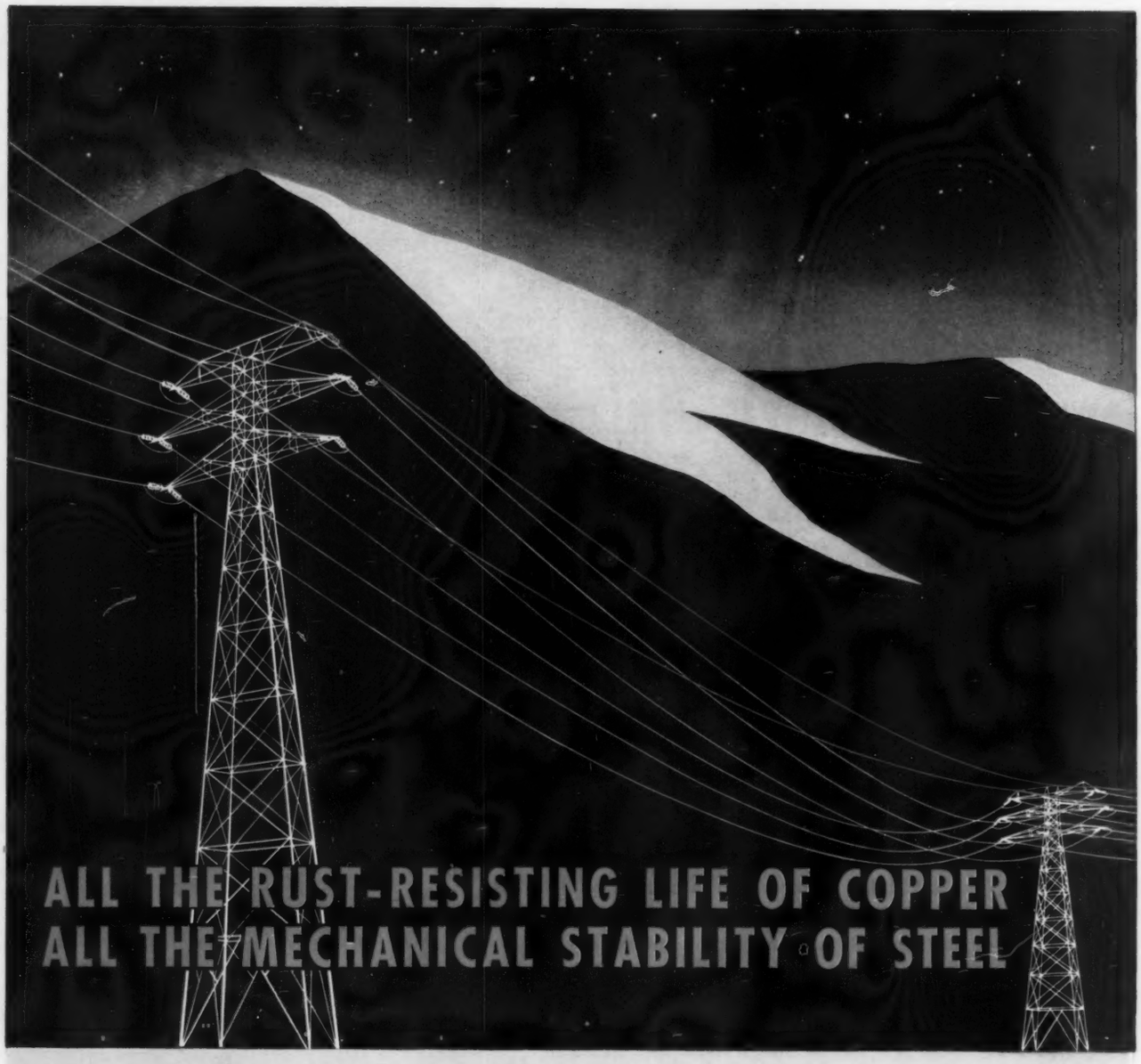
Total Saving

Coincident with the filing of the new domestic schedule, the companies announced that a cut in commercial schedules, totalling a saving of $640,000 would be made effective May 1, 1940, so that the total savings for residential and commercial customers of both companies would total $1,340,000. Of this, Portland General Electric Co. is affected to the extent of $1,600,000 and Northwestern Electric, $280,000.

Both companies stated they would file identical rates covering the territory they serve in the state of Washington with the Washington Department of Public Service, so that the rate would be uniform over the entire territory of both companies, which extends from Woodland, Wash., and Rainier, Ore., on the north to Salem, Ore., on the south, and covering the width of the Willamette Valley farming area of Oregon. Cities, rural areas and farms will all come under the one tariff. Both companies made it plain that the reduction reflected not only the immediate saving of Portland General Electric Co. from the purchase of Bonneville power, but also improved business conditions.

Domestic Schedule

The new domestic schedule is a straight block rate with 50 kw.-hr. offered at 3.5c, 75 at 2.6c, 100 at 1.6c, 100 at 1c, 500 at 7c (designed for water heater users and optional with the present 0.8c for off-peak service), and the excess at 1c. The present rate is 34 kw.-hr. at 5c, 40 at 3c, excess at 1.8c with water heating metered separately at 0.8c. The new minimum is reduced from $1.00 to 85c. Low-use



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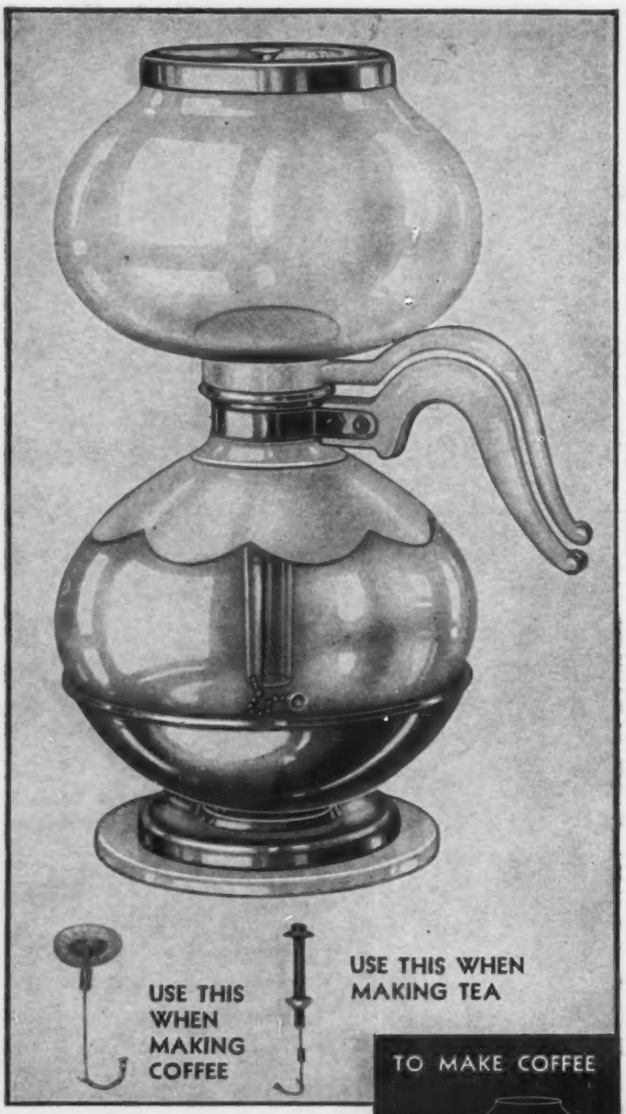


Sensational Single Unit Coffee and Tea Maker

Tea experts laughed when we told them they could make perfect tea in a vacuum type coffee maker. Said they - "It just can't be done. Good tea requires boiling water. Hot water rising from below "bogs" down the flavor. Boiling water must be poured or sprayed over the tea leaves to release their rich delicate flavor."

When we showed these experts the vented upper bowl which forces the water to boil before it rises to the upper bowl and the Tea Spray which sprays boiling water down on top of the leaves, these experts hailed us as wizards. "This", they said, "is the first perfect tea maker produced in 1600 years of tea drinking."

And now we announce a second major triumph. A single unit that is *both* a Silex Glass Coffee Maker and a revolutionary Silex Spray Tea Maker.

The upper bowl of this new unit is vented and is provided with a vent-hole closure. To brew perfect coffee, close the vent hole and use the patented Silex Coffee Filter. To brew tea, open the vent hole and use the Silex Tea Spray.

To introduce this new double purpose unit, it is being offered until February 29th, 1940 at an especially attractive price.

Electric Model (8-cup size black trim) $6.70 VALUE **Special Price $4.95**

All specials are also available in 10-cup sizes and with the new startling ivory trim or in red trim at slightly higher prices.

Kitchen Model (8-cup size black trim) $4.70 VALUE **Special Price $2.95**

The double purpose model is a "natural." And at these bargain prices every family will buy. Profit from this sensational opportunity. Place your order now.

PYREX BRAND GLASS. HANDY UPPER BOWL HANDLES.

THE SILEX COMPANY - HARTFORD, CONNECTICUT

"Creators of the Glass Coffee Maker Industry"

Genuine SILEX GLASS COFFEE MAKER

TRADE MARK REGISTERED U.S. PAT. OFF.

SEE THESE NEW MODELS AT ROOM 907 W, PALMER HOUSE, CHICAGO, JANUARY 7TH TO 13TH

TO MAKE COFFEE
Close vent hole by sliding closure up
Use patented coffee filter
TO MAKE TEA
Open vent hole by sliding closure down
Use Silex Tea Spray

NEW Genuine PYREX GLASS COFFEE MAKER ENTRIES in the 1940 Sweepstakes

TRADE MARK REGISTERED U.S. PAT. OFF.

Narrow Neck Models for Better Pouring

These are the added entries in a race in which everyone wins. Now you have models to meet every demand.

The electric Catalina Model at the new low figure of $6.95 (either black or ivory trim) will win in a walk — It is complete with Anyheet Thermostatic Temperature Control and "self-timing" stove. Packaged in a gold foil gift box.

Wide Neck Models for Easy Cleaning

The Saratoga has removable chrome lower bowl decoration and Moldex trim in black or ivory. Equipped with Anyheet Thermostatic Temperature Control and "self-timing" stove.

In the Bretton Models you have a choice of ivory or black Moldex removable lower bowl decoration and handle. Place your bets on these models.

Pyrex brand glass. All units complete with upper and lower bowl covers and Dippex coffee measuring spoon.

$4.90 OR 17% EXTRA PROFIT FOR THE DEALER

Special Introductory Offer a $2.95 Unit and 3 Ivory Guest Trays FREE when you buy this Sweepstakes Assortment

Retail Value $33.65 - Your Special List Price Only $28.75

OFFER EXPIRES FEBRUARY 29, 1940

BRETTON BLACK KITCHEN MODEL
$2.95 Cat. No. BWK-8-B

CATALINA IVORY ELECTRIC MODEL
$6.95 Cat. No. E18
Ivory Tray 65c

SARATOGA IVORY ELECTRIC MODEL
$6.45 Cat. No. SAE-8-I
Ivory Tray 65c

BRETTON IVORY KITCHEN MODEL
$3.45 Cat. No. BWK-8-I
Ivory Tray 65c

BRETTON BLACK ELECTRIC MODEL
$4.95 Cat. No. BWE-8-B

CATALINA BLACK ELECTRIC MODEL
$6.95 Cat. No. CEB-8

Sweepstakes Assortment Cat. No. 1940A — $28.75

'SELF-TIMING' STOVE

An exclusive patented feature. Uniform period of infusion assures uniform coffee. Brew returns to lower bowl without removing glass from stove.

ANYHEET THERMOSTATIC TEMPERATURE CONTROL

An exclusive patented feature. Keeps coffee at correct serving temperature indefinitely. Provides choice of any heat without variation, regardless of voltage. You simply "dial your heat."

REMOVABLE BOWL DECORATION

An exclusive patented feature. Gleaming chrome plate. There is no danger of setting up heat strains by burning decoration directly on the glass. Heat strains cause breakage. Plain undecorated glass costs less for replacements.

SNAP-IN DETACHABLE DECANTER COVER

A patented feature. Permits easier pouring without lifting cover. And it's out of the way when cleaning the bowl.

SPRING TENSION FILTER

An exclusive patented feature. No danger of filter falling out or breaking bowl. Perfect flavor and freedom from dregs requires cloth filter. Upper bowl may be inverted when brewing is completed.

UPPER BOWL HOLDER & GUEST TRAY

Invert the upper bowl on this gleaming Moldex tray. Or use the tray for individual serving at buffet parties or for serving cocktails or other drinks.

customers to the number of 40,000 will receive the greatest benefit, the savings being from 20 to 30%. Higher use customers will save from 9 to 20%.

In an exchange of letters following the signing of the Bonneville contract by Portland General Electric Co., but preceding filing of the new tariff by about a week, Ormond R. Bean, Commissioner, had asked the cooperation of the Bonneville staff in a study and analysis of the proposed rates. Paul J. Raver, Bonneville Administrator, replied that such technical information as had already been prepared by his staff in studies of re-sale rates for the Portland area would be made available to the Commissioner, but that in view of forthcoming negotiations for a long-term contract he would not commit the Administration to approval of any rate schedule the Commissioner might deem proper at this time. When asked for a comment on the rate schedule announced Dec. 15, Dr. Raver said he had no comment and indicated that the Commissioner should be left free to make his own determination of the propriety of the suggested rates without any interference from Bonneville.

Portland G-E Signs First Major Contract for Bonneville Power

First major contract for the sale of Bonneville power to a private utility company was signed by Bonneville and Portland General Electric Co., Portland, Dec. 2. Also on that date the physical hook-up between the company's 57,000-volt system and the Bonneville backbone line at Bonneville's St. John Substation was completed, and the temporary connection that had been made near the dam with Northwestern Electric Co.'s transmission line was disconnected. This act automatically terminated the temporary contract between Bonneville and Northwestern Electric Co. under which Northwestern bought power at the dam and sold it to Portland General Electric Co. through its inter-connection in Portland.

The new contract is for one year with the option for renewal by the company for a second year if in the interim a permanent, long term contract has not been negotiated. But this short term interim contract contemplates that a long term tie-up will be effected before Aug. 15, 1940. The company agrees to take 10,000 kw. of firm power until June 1, 1940, and 20,000 kw. thereafter. This is to be paid for at Bonneville's regular $17.50 per kw.-yr. rate for firm power. In addition the company may buy surplus power at 2½ mills per kw.-hr. as such energy is required, if it is available. It is estimated that this contract will yield between $400,000 and $600,000 revenue to the government, depending on the amount of surplus power made available to and used by the company.

Canby, Oregon Becomes Third Bonneville Customer

The city of Canby, Ore., having its own municipal distribution system and a long-time wholesale customer of Portland General Electric Co., became the third municipal customer of Bonneville Dec. 22 by the execution of a 20-year contract with the Bonneville administration for 300 kw. Portland General Electric Co. has agreed to transmit the power until Bonneville can extend its own line to the city.

Once more as in the case of the Bonneville-Forest Grove contract, resale rates are stipulated in the contract with Canby, and these new rates, which grant a substantial reduction, are identical in domestic and commercial service with the new rates of Forest Grove. Domestic customers will pay 3c for the first 50 kw.-hr., 2c for the next 50 kw.-hr., 1c for the next 200, ½c for the next 900 and ¾c for all over 1,200 kw.-hr. This represents a saving from present rates of about 25% to nearly 50%, depending on the use.

Commercial customers' new rates will start at 3c and step down to a low step of .3c for use of over 100,000 kw.-hr. per month. This represents savings of upward of 40%.

Again, as in the case of the Forest Grove contract, the contract with Canby dictates how much the city may pay into its general fund from electric earnings in lieu of taxes, and as a return on investment in electric property.

Canby has retired all the debt against its electric properties from earnings during the past several years. It has operated a municipal electric system since 1922. It now has approximately 400 customers.

ALCOA's New Northwest Plant To Use Bonneville Energy

Aluminum Company of America will construct a new reduction plant on the Columbia River near Vancouver, Wash., in 1940, taking its power requirements, 32,500 kw., from Bonneville according to announcement Dec. 23 by J. P. Growdon, chief hydraulic engineer for the company. Growdon made the announcement in Portland, Ore., as soon as the deal for 200 acres of land for a plant site two and one-half miles west of Vancouver, Wash., had been closed.

Contract for the purchase of power necessary in the electrolytic process for the reduction of aluminum had previously been closed with the Bonneville Administration. Dr. Paul J. Raver, Administrator, concurrently declared that this contract provided the company would take 27,000 kw. initially, increasing its demands at the rate of 500 kw. per month until it is purchasing a total of 32.500 kw. The company will pay $17.50 per kw.-yr., the regular kw.-yr. schedule for all purchasers of power from the transmission line system. This is the first industrial customer of Bonneville, and, according to Dr. Raver, it presages a new industrial expansion in the Pacific Northwest. "I believe establishment of the aluminum operation as a new basic industry in the Pacific Northwest represents only the beginning," he said. "Development of this and other industries new to the Pacific Northwest means new payrolls and new markets for the merchant and the farmer."

This project represents an expansion of operations for the Aluminum Co., making the fifth reduction plant in the United States. Others are situated at Niagara Falls and Massena, N. Y., Alcoa, Tenn., and Badin, N. C. The aluminum produced at the new plant will be electrolyticly reduced from alumina shipped to the Pacific Northwest site from the company's two purification plants at East St. Louis, Ill., and Mobile, Ala. It is understood that the deep water facilities at the company's new site was an important factor in the choice of a location. The company's decision to establish additional manufacturing facilities in the Northwest was said to be influenced largely by the growing market for aluminum on the Pacific Coast partly in the manufacture of airplanes which is also a growing industry in that area.

Washington PUD Signs 5-Year Bonneville Contract

Public Utilities District No. 1 of Klickitat County, Wash., contracted Dec. 6, for not less than 1,500 kw., of Bonneville power, first delivery to be made at Glenwood, Wash., within four months.

The contract, to run for 5 years, was signed by Bonneville Power Administrator, Paul J. Raver, and M. A. Collins, chairman of the utilities district, after a conference at Goldendale, Wash.

The district's first customers, Collins said, would be the Klickitat County commissioners, who plan to install a large rock crusher at Glenwood requiring 100 kw. of power.

Other deliveries of power called for in contract included 350 kw. at Gilmer, Wash., and at least 1,150 at Klickitat, Wash. These deliveries will follow closely upon that to be made at Glenwood.

You'll please your customers

By Using G-E Quality Wiring Materials

Naturally your customers want wiring that is suited exactly to their needs. What's more they want wiring that gives good service—that they can practically forget about once it's in.

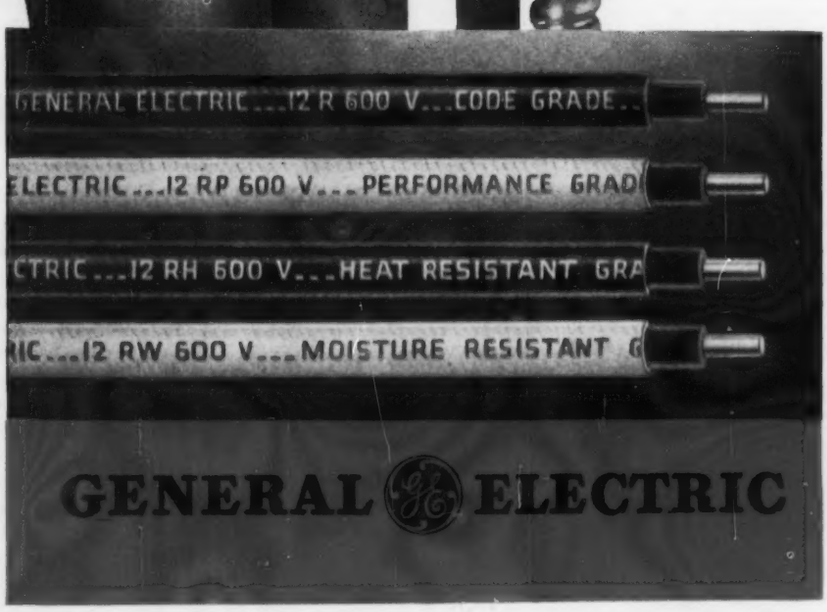
Right Materials for Job

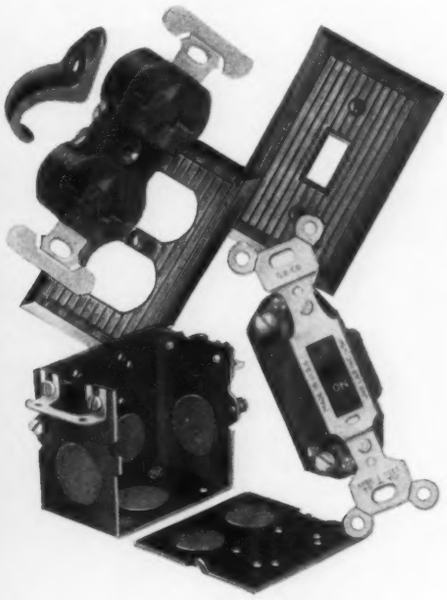
By using General Electric wiring materials you will be able to install just such wiring. No job will ever have to be makeshift. There is exactly the right material in the G-E line needed for any type of installation. Of course, the complete G-E line aids in selling and installing adequate wiring too.

Uniformly High Quality

But even more important, when G-E materials are installed, the resulting wiring system can be depended upon to give your customers years of satisfactory service. The quality of all G-E wiring materials is uniformly high. Only the finest raw materials are used. Rigid specifications govern the manufacture of all materials.

For more information about the G-E quality conduit and conduit products, wiring devices, or wire and cable, see the nearest G-E Merchandise Distributor, or write to Section CDW-0231, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.


GENERAL ELECTRIC....12 R 600 V....CODE GRADE..
ELECTRIC....12 RP 600 V....PERFORMANCE GRAD
CTRIC....12 RH 600 V....HEAT RESISTANT GRA
RIC....12 RW 600 V....MOISTURE RESISTANT G
GENERAL ELECTRIC



Bonneville Engineering Dept. Set Up To Speed Delivery

Engineering Division of the Bonneville Power Administration was organized Dec. 4, on a functional basis to speed delivery of power to all units of its network throughout the Pacific Northwest.

The new setup, involving no change in the number of personnel within the division, includes the formal appointment of S. E. Shultz as acting chief engineer and the promotion of Charles E. Carey to the post of chief consulting engineer.

Shultz, a consultant who came to Bonneville last September from the post of chief electrical engineer of the Port of New York Authority to formulate general engineering plans for system development and integration of Northwest power resources, has been functioning as acting chief engineer for some time, although that position was never before formally filled.

Carey, until elevation to his new position, was principal construction engineer. In his new post he will head a consulting staff which will act in an advisory capacity on general engineering matters. Before joining Bonneville's staff he was a consulting engineer in Seattle and northwest resident engineer for the Westinghouse Electric Co.

Ben W. Creim, former REA chief engineer for the 11 western states, is chief of Bonneville's construction section. An assistant to Carey since last summer, Creim will have active supervision of all construction activities.

Other section assignments involving only minor shifts in duties:

Orin Demuth, senior system engineer; H. R. Stevens, senior inspection engineer; T. C. Smith, distribution engineer; C. C. Long, operations engineer, and R. F. Stevens, design engineer. Don Campbell will retain his post as senior engineer in charge of transmission design. Dean Wright will continue as supervisor of drafting.

Metcalf To Head New Bonneville Division

Formation of a System Planning and Marketing Division within the Bonneville Power Administration as a step in a broad program to expedite power delivery and sales throughout the Pacific Northwest has been made.

The new division, which supersedes the old Project and Contract Division, will utilize existing personnel with James I. Metcalf as acting chief.

Metcalf, who has been with the project as consulting power economist, will be assisted by Ivan Bloch, project marketing specialist and electrical engineer, Warren H. Marple, distribution expert, Barclay J. Sickler, project rate specialist, and H. E. Bixby, authority on operations.

In explaining the purpose of the new division Administrator Raver said that it would devote its attention to expediting power sales, working out wholesale and resale rates and in planning the economic extension of the Bonneville transmission system.

City of Provo To Buy Local Utah Power System

Arrangements for sale to Provo, Utah, of the Utah Power & Light Co.'s distribution system in the corporate limits of the city were completed Dec. 4 at a special meeting of the city commission, officials of the utility and the Ulen Contracting Corp. of Lebanon, Ind. The power company's franchise expires Jan. 27, a proposal to give the company another 10-year franchise being voted down by Provo citizens Nov. 7.

Price of the system was set at $160,000, with $40,000 to be paid down and the balance when the system is turned over to the city on April 1, 1940. The company agreed to purchase materials bought by the Ulen Contracting Corp. for the city distribution plant and also agreed to provide standby service for the city plant at a cost of 1c per kw.-hr.

PG and E Declines to Apply For Major License from FPC

Pacific Gas and Electric Co has declined to apply for a major license from the Federal Power Commission for its Melones project in California, and accused the commission of proposing "unjust and oppressive" legal proceedings against it.

PG and E stated that the minor part license is valid in all respects and can be altered only upon mutual agreement by the concern and FPC. The company also said that the Melones reservoir is not part of the power project, but was constructed and is owned by Oakdale irrigation districts.

● The Southwestern Public Service Co., Rosewell, N. M., has been ordered by the Federal Power Commission to show cause on or before Jan. 15, why it should not file with the Commission, pursuant to the Federal Power Act, an appropriate application for license for its hydroelectric project on the Pecos River. The Commission found that the U. S. owned lands on both sides of the Pecos River at the site of the project, upon which lands the project operations may cause an overflow.

Oregon Proposed PUD Defeated At Special Election

The proposed PUD in Lane County, Ore., was decisively defeated at a special election Dec. 8. The vote was 2890 against to 1901 in favor. The total vote was said not to be large for a special election in this area.

The vote in the five incorporated cities, Springfield, Cottage Grove, Junction City, Creswell and Coburg, was unfavorable by about 3 to 1. The suburban and rural areas also returned a majority against the formation of the PUD but by a closer margin. The district embraced most of the eastern part of Lane County, exclusive of the city of Eugene and an area surrounding the city served by the Eugene Municipal plant. The extreme western part of the county, wherein lie the Coast mountains and the slopes to the Pacific was also excluded.

Puget Sound Applies For Canadian Import Permit

Puget Sound Power & Light Co. has applied for a presidential permit to import electric energy from Canada. The utility stated that its application was filed under protest upon the ground that "neither the President of the U. S. nor the Federal Power Commission has any authority to require application for or to grant permits for operating or maintaining facilities used solely for the importation to the U. S. and not for the exportation from the U. S. of electric energy."

Puget Sound purchases energy from the British Columbia Electric Railway Co., Ltd., solely for the purpose of resale to customers in and near Point Roberts, Wash. During 1938, the company purchased 193,930 kw.-hrs. of energy at a cost of $3,669.

Olds Named New FPC Chairman Succeeding Seavey

Leland Olds of New York has been elected chairman of the Federal Power Commission, for a term of office which extends to June, 1944. He succeeds Clyde L. Seavey of California, who has been head of the Commission since Frank McNinch was transferred to the Federal Communications Commission. Olds, for a number of years, was executive secretary of the Power Authority of the State of New York.

Claude L. Draper of Wyoming has been re-elected vice-chairman of the Commission for 1940. A senior member of the FPC, Draper is the only remaining commissioner appointed by President Hoover in 1930.

TRIP-O-LINK 2-SHOT TRIP-SAVER ON A BRANCH FEEDER
KEARNEY TRIP-SAVER ON A BRANCH LINE PROTECTS MAIN CIRCUIT
HOOK OPERATED DISCONNECTS ON MODERN SUBSTATION
A FEEDER POINT IS PROTECTED BY THREE KEARNEY TRIP OUTS
FOR AMPLE CLEARANCE KEARNEY ROTATING INSULATOR GANG SWITCH
FAULT ARRESTER COMBINATION TRIP-O-GAP TRIP-O-LINK
QUICKLY RE-FUSED-TRIPOMATIC USED ON 4000 V. CIRCUIT
KEARNEY BY-PASS DISCONNECTS REPLACE NINE CONVENTIONAL TYPE DISCONNECTS
ON EXPOSED CIRCUIT KEARNEY TRIP-O-LINK FOR LOWER COSTS
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An Instruction Guide To Economical Purchasing Of Modern Switching Equipment That Reduced Operating Costs
BULLETIN 312
SWITCHES

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KEARNEY SWITCH BULLETIN No. 312

If You Do Not Have This Bulletin 312 — Write Today.

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Washington PUD Development Threatened by Suit

Development of public power districts in the state of Washington was seriously threatened in a suit appealed to the State Supreme Court recently involving the question of whether districts can condemn and buy private power companies without a vote of the people.

The question was brought to the court by the Grays Harbor public utility district which was enjoined from paying $2,842,000 for the Grays Harbor Railway & Light Co., on the grounds it failed to secure approval of the voters to the purchase.

So vital was the issue involved that the Washington State Grange, the Washington Public Utility Assn., and many of the state's score of districts intervened in an effort to upset the lower court decision.

John Abayha and the city of Aberdeen secured a permanent injunction in lower court barring acquisition of private utilities and issuance of $3,350,000 in revenue bonds to pay for it and for subsequent expansion. The bonds would be retired solely in the district's earnings.

In a similar action in Skagit County, Judge E. D. Hodge said shortly after the Grays Harbor Court decision that he believed no election was necessary for the Skagit Power District to acquire the Sedro Woolley utility properties.

Attorneys for the Grays Harbor PUD urged the Supreme Court to decide the case as soon as possible, since its contract with the private utility to purchase its holdings expired Jan. 2, 1940.

They also said if the court could decide the case by December 15 the district would be able to withdraw its $43,000 tax levy on the county if the decision was favorable.

The two main questions presented in the appeal were whether an election was necessary and whether the commissioners passed in sufficient time plan and system resolution to acquire the utility. The lower court held the resolution had to be passed before the district was committed to purchase the private company.

TELESCOPE BM SYSTEM

CONNECTORS AND COUPLINGS

Cadmium Finish for Electrical Metallic Tubing

B-M Connectors and Couplings make the neatest installations. No nuts to tighten, just two squeezes with our Indenter and the fitting is securely fastened to the tubing.

B-M fittings are so much lower in price that the savings on the first job will more than pay for the Indenter required. Our tools and method of fastening the fittings to the tubing are patented, and we limit the license of our tools under these patents to the installation of our fittings only.

Listed by Underwriters

No. 665. Price $1.35

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TRIANGLE CONDUIT & CABLE CO., Elmhurst, New York City
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BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

Appliances Sales Jump During 1939

According to the Inland Empire Electrical Equipment Assn. at Spokane, intense public interest in electrical appliances during the first nine months of 1939, was reflected in a marked increase in appliance sales over the like 1938 period. A compilation indicated nine major items showed a definite increase, according to association executives, who stated that air-conditioning units sales increased 300%; ventilating systems, 40%; radio sales, 35%; water heaters, 28%; ranges, 20%; electric roasters, 16%; refrigerators and washers, 11%.

Between June 12 and Sept. 2, 1939, 1099 electric water heaters were sold in the Inland Empire, it was stated.

In 1923, there were 5,000 ranges in service in the Inland Empire, and 30,000 electric service customers were without ranges. In 1930, there was an increase to 13,000 ranges in service, but there was also an increase of 7,000 customers without ranges. The 1937 survey showed 21,000 ranges in service, and 44,000 electric service customers still using other than electricity for house cooking.

Cowlitz County PUD Trial Postponed to Jan. 30

Trial of the suit filed by the Public Utility District No. 1 of Cowlitz County, Wash., against the Washington Gas & Electric Co., has been postponed from Jan. 8 to Jan. 30. Postponement request was made at a hearing on Dec. 7, before Federal Judges John C. Bowen and Lloyd L. Black. Judge Black will preside over the suit in Tacoma. The suit, first of its kind to be heard in Washington, involves property with an estimated value of $5,000,000.

New Draft of Hoover Dam Rate Revision Bill Set

Legislative attempts to revise the scale of power and interest charges at Hoover Dam were indicated late in November when plans for a meeting of power representatives was scheduled. Conferences with the Interior Department experts were expected to push through Congress a new draft of the long-pending rate revision bill which has been the subject of heated dispute between Hoover Dam contractees for more than two years.

Both the Bureau of Power & Light and the Metropolitan Water District were reported to be in agreement over one of the most controversial points in the projected legislation. A plan to make the power bureau operating agency for the government, in the matter of generation and distribution of energy, will encounter no opposition from the water district, officials said.

Agreement between California, Arizona and Nevada and the upper basin states of Wyoming, New Mexico, Colorado and Utah over a yearly fund to be derived from excess revenues from the dam, also is expected.

Hearings on the proposal of downward rate revision, suspended when Congress adjourned last August, are expected to be resumed when the legislators return this month.

Southern California Edison to be Large-Scale Radio Operator

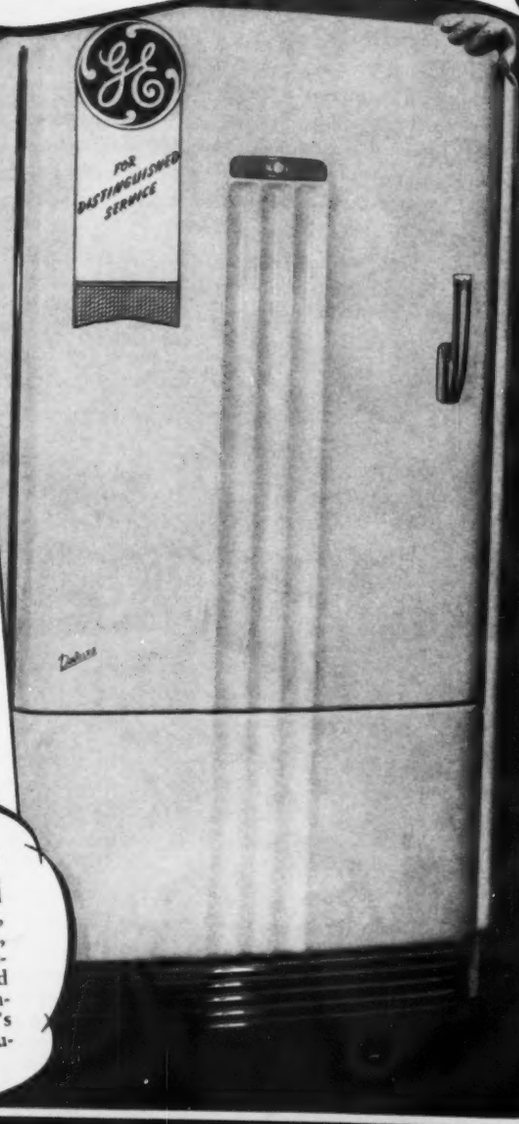
Unless the Communications Commission should for some reason halt or delay proceedings, Southern California Edison Co. will be a large-scale radio operator early this year. In process of construction are eight 50-watt radio stations, and 20 patrol cars are being equipped with 15-watt transmitters.

Meanwhile, the Edison program, under the direction of T. M. Hotchkiss, has concerned itself with such items as ironing out details with the Commission and the Civil Aeronautics Authority and qualifying 150 employees with "restricted operator" permits, which is the new type of permit necessary for personnel operating such types of stations.

The fixed stations will be equipped with 150-ft. poles for antennas, and the poles will be painted and lighted for the safeguarding of airplanes.

To be licensed for emergency use, the stations will operate simplex, but two frequencies will be involved. These are 2,292, available day or night and restricted to the use of public utilities, and 4,637½, available in the day only and confined to transmitting from fixed stations.

And G-E Will Do It Again in 1940!



EVEN FINER FOR '40!

It's hard to improve so fine a product as the 1939 G-E Refrigerator, but General Electric has done it for 1940! And in spite of rising raw material costs, prices remain at the same *all-time low* on all popular G-E models.

Even finer styling, even finer features such as Selectrive Air Conditions with *Controlled Humidity*, Stainless Steel Shelves, Air Filter, and Illuminated Control Dial. Even the famed G-E Sealed-In-Steel Thrift Unit freezes more ice faster and uses less current than ever in the popular 8 cu. ft. DeLuxe models.

We paced the field in '39 and *we'll do it again in 1940!*

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Appliance and Merchandise Dept.
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A FULL Line of electric appliances for the home—G-E Electric Ranges, Electric Sink (with Dishwasher and Garbage Disposall), Water Heaters, Washers, Ironers, Cleaners, Radios, Sun Lamps, Clocks, Fans, Small Appliances. Backed by the combined research, engineering skill and manufacturing experience of the world's oldest and largest electrical manufacturer.

GENERAL ELECTRIC

PSC Grants Utah Power Application for Discount

The Public Service Commission has granted the Utah Power & Light Co. application to establish a uniform discount period of 15 days for all classes of electric service. In the past the period has varied on different types of service between 10 and 15 days. The company was also authorized to reduce the interest rate on customer deposits from 6 to 4%, the general interest level having dropped in the last few years.

Slated for early hearing by the Commission is a proposal to reduce rates charged by the Big Springs Power Co. of Utah, so that consumers will be saved at least $2,500 a year. The company provides ultimate consumer service in Moroni, Fountain Green and several rural areas in central Utah and sells power wholesale to the municipal plant at Nephi, Utah.

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Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
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WITH PLAIN OR ASTRONOMIC DIALS
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H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City

● CITY COUNCIL at Grand Coulee, Wash., is faced with a problem of providing a municipal power system for the town, following tabulation of ballots in an election which called for the establishment of a city-controlled system. Power from Grand Coulee may not be available until July of next year. Electorate voted 237 for and 33 against.

Tacoma City Light Fund Sought By Public Utilities Commission

An appropriation from the Tacoma City Light Dept. of $150,000 to create a "light and power development fund" is being sought by Public Utilities Commissioner Ira S. Davisson in an ordinance which was given its first reading by the Tacoma city council recently. If passed, Davisson states he intends to undertake a comprehensive survey of possibilities of extending the city's electric generating system, adding that the survey might require three years.

The ordinance asserts that "for many years use of electric energy in Tacoma has consistently increased and may reasonably be expected to continue to increase."

Further the ordinance states, that "while the capacity of the city's existing electrical generating system is fully adequate to meet present demands, it will be necessary within a few years time for the city to have available increased supply of electric energy."

The survey will be designed to "determine the most feasible, desirable and practical means of providing" the electricity likely to be needed by expanding industry and growth of the city.

FPC Reports Total Capacity of Northwest Generating Plants

The Federal Power Commission reported late in November that the total installed capacity of electric generating plants in the four Northwest states were 1,879,828 kw. The commission said Idaho's total installed capacity was 260,148 kw., Oregon's 445,879, and Washington 1,013,646.

Of the privately owned plants in Idaho, hydroelectric plants had capacity of 231,475 kw. while fuel plants had 1332 kw. Publicly-owned hydroelectric plants in the four Northwest states was fuel plants totaled 1,540 kw.

In Washington privately-owned hydro plants had capacity of 451,456 kw. and the privately-owned fuel plants 151,741 kw. The state's publicly-owned fuel plants had a capacity of 65,000 kw. and its publicly-owned hydro plants, 341,119 kw.

Contracts

To FRANK LAKE, Vancouver, for electrical wiring in new $165,000 Indian school at Alberni, B. C.

To NE PAGE MCKENNY CO., Seattle, for construction of 11-panel switchboard for the Portsmouth Navy Yard in Virginia, $16,000. The company recently completed an order for 150 power distribution panels for use in U. S. Navy cruisers.

To J. KORB, Los Angeles, for electrical work on new attendants quarters, Sacramento, $3,477.

To D. M. MANNING, Hysham, Mont., for building 69 mi. of line for the Mid-Yellowstone Electric Coop., Inc., $91,388.

To HOMER G. JOHNSON, Portland, for constructing 205 mi. of line for The Moon Lake Electric Assn. Inc., $150,405.

To HOMER G. JOHNSON, Portland, for building 160 mi. of line for the Inland Empire Rural Electrification, Inc., Spokane, $120,306.

● TO PROVIDE for future expansion, in Evanston, Wyo., and to improve present service, Utah Power & Light Co. has installed a new substation in Anderson Heights, according to R. I. Woolley, manager of the Evanston division of the utility. The sub-station erected at a cost of $16,000 includes three 333 kva. transformers, two 72 kva. regulators, and one 600 amp. automatic-reclosing oil circuit breaker.

● SEATTLE entered the loan contract column of the USHA for the first time last month. A sum of $2,700,000 will be used for a project to rehouse about 700 families from the city's slums. Average estimated construction cost of dwellings per family unit is set at $2,500.

● THE WORLD'S LONGEST floating bridge, a 1¼ mi. pontoon span which the Washington Toll Bridge Authority is building across Lake Washington on U. S. Highway No. 10 near Seattle, will be illuminated at night by 131 G-E sodium lights. Interior of a twin-bore tunnel, 1,487 ft. long, at the western approach to the bridge will also be lighted by sodium. Mercury lights will illuminate the tunnel entrances. The bridge and tunnel, part of a 6.6 mile highway project designed to shorten the eastern approach to Seattle by 14 miles, will be opened to traffic, June, 1940.

● AN ORDINANCE APPROPRIATING $25,000 from the City Light fund to buy seven 1,000 Kw. power transformers has been introduced in the Tacoma city council. The ordinance, which is assured of passage, directs the city board of contracts and awards to call for bids.

TRADE NOTES

Alameda Municipal Lighting Retires From Active Sales

Alameda Municipal Lighting plant has retired from active direct sales of electrical appliances, according to H. A. Lewicki, merchandise manager, and henceforth will devote its promotional efforts to the stimulation of dealer sales. It still offers a freewiring allowance of $40 on a range and $15 on a water heater for dealer sales and conducts a display of dealers' ranges on its main display floor. The department will also subsidize a portion of the dealers'advertising on electric ranges and water heaters.

The salesmen formerly employed by the department have been employed by dealers or have gone into business for themselves.

Although volume for the first three months since the plan has been in operation has dropped to half what it was under direct selling, it is hoped that as the effort becomes better organized the volume will be regained.

● CAZIN & HOUTZ, Evanston, Wyo., has moved into a new modern store on Main street. Gerald Cazin and Max Houtz are proprietors of this electrical firm which has grown since its opening in 1935, to be one of Evanston's leading electrical firms.

● THE RELIANCE ELECTRIC CO., 741 St. Helens Ave., Tacoma, has taken over new quarters at 1119 Commerce St. The company, headed by Edward M. Heckard, carries a full line of electric fixtures, and conducts a complete shop for making special designs and made-to-order fixtures.

● EARL REED ELLIS and O. P. Stuard are two new electrical appliance dealers in Salt Lake City. Ellis is manager of the Ellis Appliance Co., located at 919 South State Street, and handles a complete line of Kelvinator ranges and refrigerators, Zenith Radios and Bendix Home Launderers. Stuard is owner-manager of the Stuard Coal and Appliance Co. at 1117 East 27th South, and has taken on a line of Kelvinator products and Zenith Radios.

● THE WESTERN MONTANA ELECTRIC CO., located on Main Street, Missoula, for the past 20 years, has remodeled its store. J. S. Root owns and operates this modern appliance firm.

● THE NORTHWEST SUPPLY CO., Butte, Mont., distributors of plumbing supplies for several years, has added an electrical department with Leon Hampton in charge. T. N. Maxwell, Butte, is managing director of the company and R. E. Linnell, manager of the Great Falls branch. Five salesmen cover the Montana territory, handling such lines as Pass & Seynour, Clifton, Cutler-Hammer and Line Material.

● FIRM OF HAMM AND SMITH, Los Angeles has been dissolved, according to Harry H. Hamm, who has formed his own company, the Reliable Electric Service Co. at 144 Glendale Blvd., Los Angeles. Hamm has been prominent in the affairs of the Electrical Contractors' and Estimators Assns. in southern California.

● RALPH L. BAILEY has been appointed Pacific Coast manager of Whitehead Metal Products Co., Inc., succeeding J. J. Whitehead, Jr., who has resigned. Grace-Obler Co. will continue to represent Whitehead as their distributors in northern California.

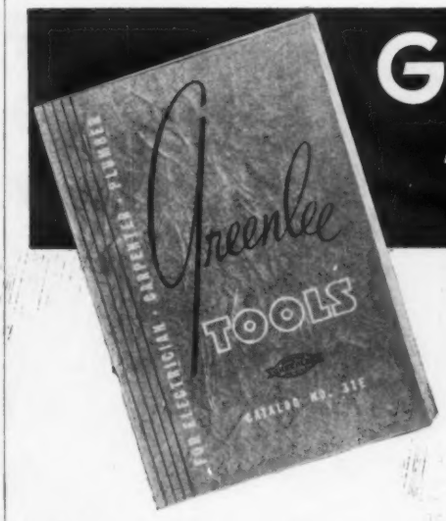
● B. J. DEJARNATT, Fresno, Calif., has been appointed a new distributor of Stewart-Warner refrigerators.

ABOUT PEOPLE

Schaaf Appointed Chief Counsel For Puget Sound Power & Light

Ferd Schaaf, who recently resigned as Washington State Public Service Director, will be chief counsel for the Puget Sound Power & Light Co. in the Public Utility District condemnation suits brought against the company in six Washington counties. His headquarters will be in the Henry Bldg., Seattle.

Schaaf, who has been with the Public Service commission for a number of years, has established a general law practice, specializing in all types of public service company cases before the state regulatory bodies in Washington, Oregon and Idaho, and before such Federal agencies as the Interstate Commerce Commission, Water and Communications Commissions. The first of the PUD cases will start April 2, with Whatcom County District No. 1 seeking in District Court, Seattle, to acquire the Puget Sound's distributing system in its area. Similar cases have been filed in Thurston, Lewis, Cowlitz, Chelan and Douglas Counties.



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Steen and Wolfe Judged Winners in AIEE Papers

Herb Steen, Seattle Cedar Lumber Co., and Dr. C. M. Wolfe, instructor, electrical engineering, University of Washington, were adjudged joint winners in the technical paper competition of Seattle section AIEE, held at the meeting, Dec. 19.

Wolfe's paper was "The Electrical De-Hydration of Crude Oil Emulsions" while Steen's discussion was titled "A Three-Element Cathode Ray Oscillograph."

Judges were: Lyle M. Robinson, General Electric; Earl B. Hansen, Pacific Telephone and Telegraph and H. H. Houston, Rayonier Inc.

● DOROTHY STEWART has been appointed home service director for the Montana Power Co. She was educated at Brigham Young Univ. and Utah State Agricultural College. After receiving her degree, Miss Stewart went to Ames, Iowa, where she took graduate work in her field. Since then she taught school in Utah, before taking up home service work with the Utah Power & Light Co. Her most recent position was that of supervisor for the Farm Securities Administration.

● H. W. DERRY, former TVA industrial engineer, has been named manager of the Pacific Power & Light Co.'s new industries department, with headquarters in Yakima, Wash. His duties, R. V. Bragg, district manager at Yakima, stated, will be to help obtain new employment-giving industries to utilize natural resources of the Columbia Basin.

● WILLIAM R. REED, Boise division commercial salesman of the Idaho Power Co., was recently awarded $10 by the Northwest Electric Light & Power Assn. as third prize winner in a contest conducted by the association for commercial salesmen in its territory. Reed's data sheets on commercial cooking installations were the foundation for his winning entry.

Three Pacific Coast district guests at the annual distributors' convention of Westinghouse's merchandising division held in Mansfield, Ohio, Dec. 4-5, were (left to right) G. M. Cramer, Electric Supplies Distributing Co., San Diego; C. A. Meier, Westinghouse merchandising manager, San Francisco, and C. E. Saviers, Reno, Nevada, prize winner for 1939 refrigerator sales

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● WILLIAM SCHACK, Newberry Electric Corp., Los Angeles, was elected president of the Los Angeles Electric Estimators at the annual election Dec. 7. He succeeded Claire Smallcomb, Smallcomb Electric Co. C. "Art" Rowley of Thermador Electric Mfg. Co. was elected vice-president; Fred Ulbrich, electrical contractor, treasurer; John Strickley of Frank Wiggins trade school, secretary.

● RICHARD A. BUCKBY has resigned from Incandescent Lamp Division of the General Electric Co., South Pacific District, Los Angeles, to become manufacturer's agent. He will carry the Leonard R. Foss shades and other lighting lines in southern California with an office at 315 West Lomita, Glendale. Buckby was with G-E Lamp Division since 1927, with Curtis Lighting Co. prior to that and with Pacific Gas and Electric Co. lighting sales at Sacramento in 1925.

● WILLIAM L. CONE, safety director Utah Power & Light Co., has been named chairman of the membership committee of the Public Utilities Section of the National Safety Council.

● C. E. INGALLS, manufacturers' agent, attended the Copperweld Steel Co.'s sales conference at Glassport, Pa., in December. His son, Robert E. Ingalls, also attended the meeting.

● LYLE E. PATTON, who for the past 10 years has been associated with the late Robert L. St. John, will carry on consulting engineering practice under the name of the Robert L. St. John Co. at No. 1 Montgomery Street, San Francisco.

● FRANK W. LOOMIS is now southern California commercial engineer for the Hygrade Sylvania Corp., with offices at 1630 Flower street, Los Angeles.

Higson and Kelm Advanced at Utah Power & Light

C. R. Higson, superintendent of system distribution for the Utah Power & Light Co. since 1928, became special consultant in connection with distribution engineering and operation for the entire system, and Alfred C. Kelm moved from Salt Lake division superintendent to system superintendent.

Higson became affiliated with Utah Power in 1912, following his graduation from the Univ. of Wisconsin and four years of instruction in its electrical engineering school. In 1913 he became assistant engineer, in 1918 distribution engineer and in 1928 superintendent of distribution.

KELM HIGSON

Kelm, also a Wisconsin graduate, was employed by the company in April, 1916, as an operator at its Grace, Idaho, power station. He rose from this post to assistant superintendent, then superintendent of the Grace plant and distribution engineer. He came to Salt Lake City in 1929 as assistant superintendent of the local division.

● ADDISON B. DAY, once named by the Los Angeles Realty Board as "the most outstanding citizen in Los Angeles," and a veteran utility man, died Nov. 28, in Los Angeles. Mr. Day's business career began in the ranks of the Los Angles Lighting Co. in 1895, and he rose to the presidency of this organization in 1928. Among his past affiliations were: president of Pacific Coast Gas Assn., 1920, president Pacific Coast Electrical Assn., 1932, and head of the All-Year Club of Southern California in 1933-4.

He was born in Chicago, in 1874, and came to Los Angeles with his parents, Mr. and Mrs. Alphonso C. Day at the age of 12. Besides his widow, he leaves two sons, Herbert and Robert Day.

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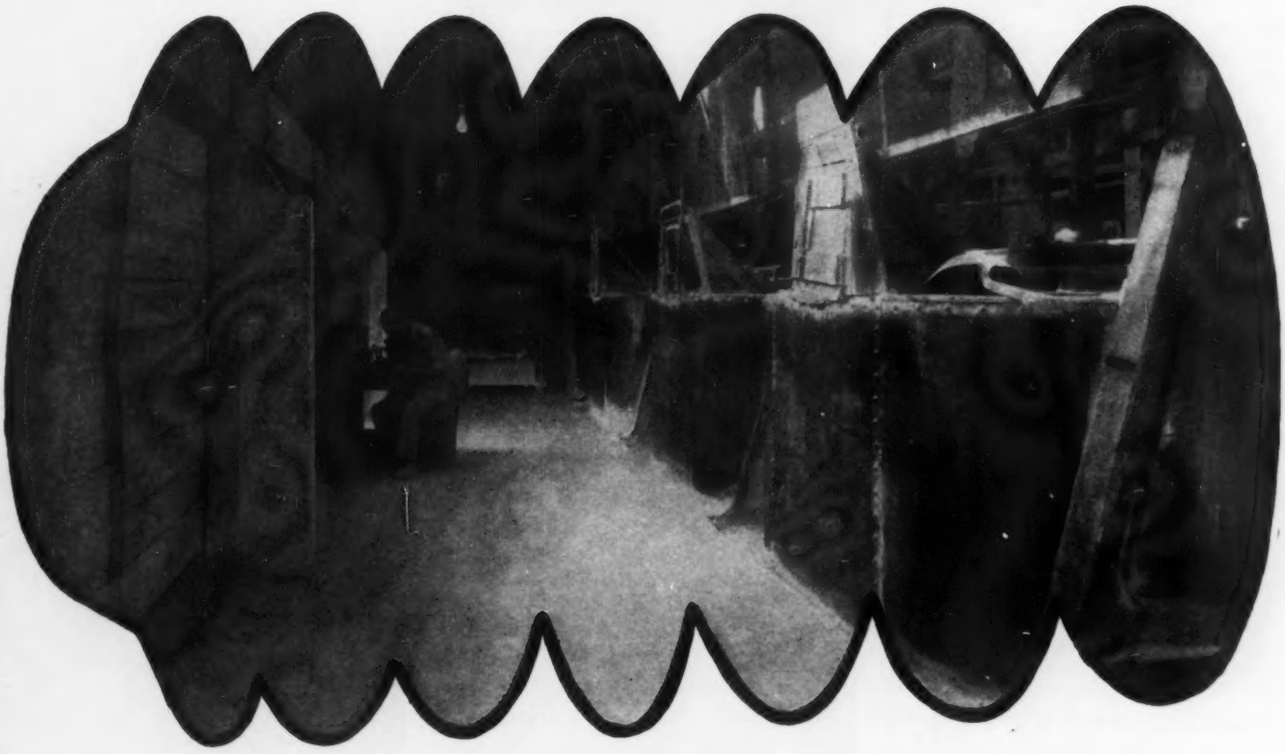

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PROFILES OF THE MONTH

President Frank McLaughlin of Puget Sound Power & Light Co. shows real pride in Puget Sound's two 50-year service veterans, John Quinn of Seattle (left), and Tom Montague, Bellingham. More than 300 Puget Sound veterans gathered recently to celebrate an Old Timers' Get-Together

H. W. Derry (left) has joined Pacific Power & Light as manager of a new industries department, while H. H. Schoolfield has been named general superintendent of mechanical details of system operation at Pacific Power. Derry served three years as principal industrial engineer at TVA

Owen D. Young (left) greets Philip D. Reed, and Gerard Swope greets Charles E. Wilson (right) after an announcement Nov. 17 that Reed and Wilson succeed Young and Swope at G-E

. . . and how do YOU feel about 1940

AT the beginning of every New Year, you hear this question up and down a thousand Main Streets. Business men trade opinions, hoping to find out what the other fellow is thinking and what commitments he is planning to make. This year, with a war in Europe and another in the Orient, there's an even greater amount of speculation.

Occasionally one encounters a long face and a prediction of calamity. But any survey of conditions generally throughout the nation should lead one to believe that, war or no war, business conditions are improving, and should continue to improve for the next two quarters, at least.

One reason is that appliance sales have been going up and there is a certain momentum behind any such increase.

Also, we observe a "go ahead" attitude in other quarters. For example, the replies to Colonel Leonard Ayres annual questionnaire showed an overwhelming opinion that business is getting better. Out of 500 top-flight business leaders who were asked whether they expected and were planning for an increase in sales, 456 replied emphatically "yes."

Another factor is that most market indices are up. As this is written, electric power production has just reached an all-time high. Automobile production is up. Steel production is up. Carloadings are up. The composite Associated Press index for last month showed the greatest activity since November, 1929.

Still another factor is the marked upswing in farm commodity prices. Even our California growers who were expected to be hard hit by the curtailment in overseas purchases are not doing nearly as badly as was feared.

Finally, there is the attitude of appliance manufacturers, based partly on factors already mentioned and partly on indices peculiar to their own business. According to local distributors who have recently returned from their annual home-office conferences, the appliance industry is gearing itself for a 10 to 15 percent increase between now and June.

Of course all these factors apply to the general market situation and everyone who reads the papers knows about them. So keep in mind that while people have more money, or at least are showing an increasing desire to spend their money, other industries are just as aware of the fact as we are and just as determined to do something about it.

For our part, we can do nothing better than face the facts squarely, recognize that more business is in sight for those who will go after it—and then go after it! Optimism won't get us anywhere until we translate that optimism into action.

Let's remember, too, that we have machinery set up in the Electric Appliance Society and the Pacific Coast Electrical Bureau for *collective* action, and that by collective action we have "made our breaks" on more than one occasion, and in far less promising times than these.

Let us all who lead the industry keep on at the job of educating the smaller dealers to plan their work and work their plans. Let us show them by example that setting up a quota and laying out a careful plan of attack is far better and more profitable than sporadic, hit-or-miss merchandising.

And above all, let us show them what is meant by "follow through."

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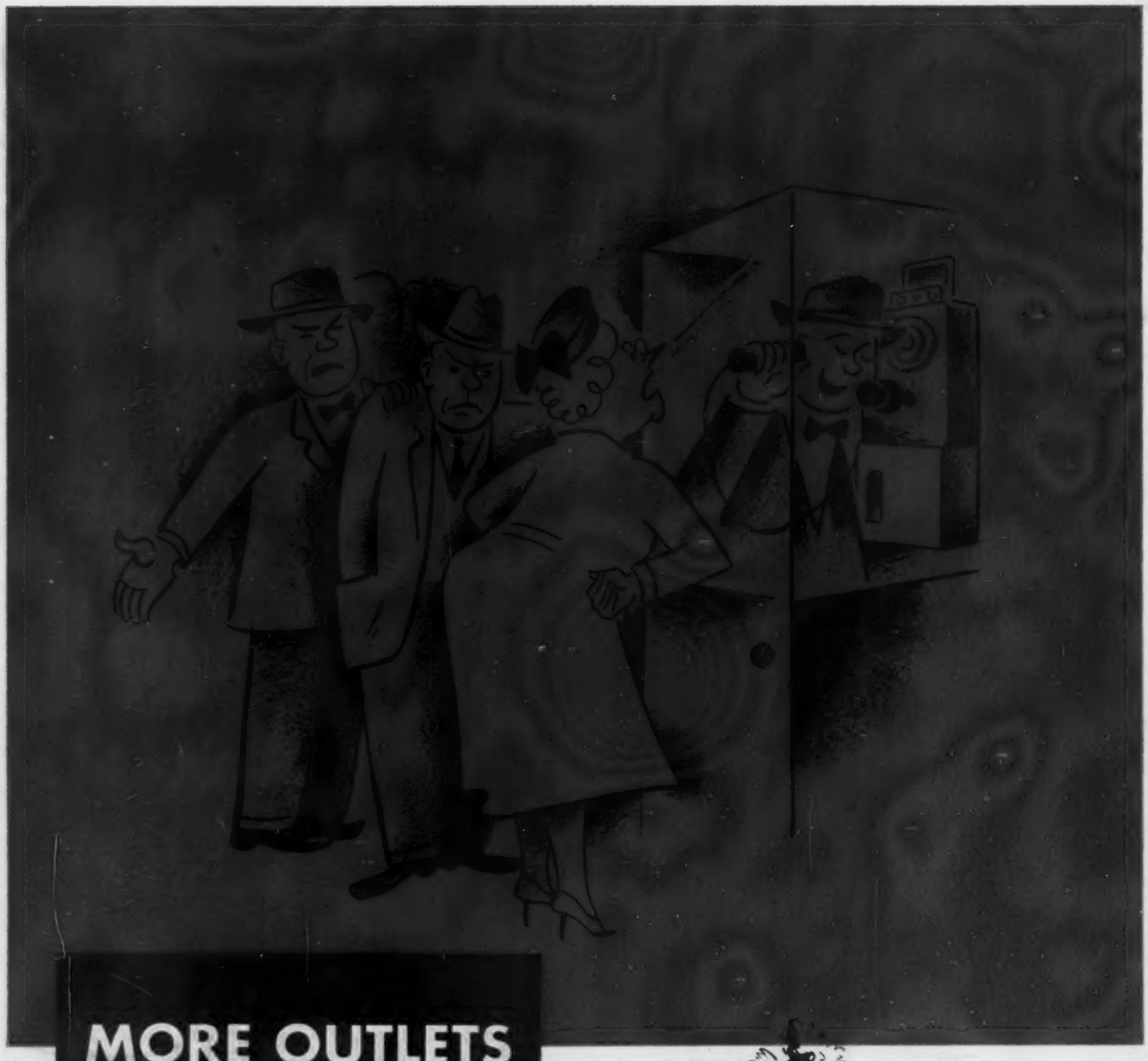

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